SUGGESTIONS

FOR THE PREVENTION OF THAT INSIDIOUS,

AND

DESTRUCTIVE FOE,

TO THE

BRITISH TROOPS IN THE WEST INDIES,

COMMONLY TERMED THE

YELLOW FEVER.

WITH THE

OUTLINE OF A PLAN OF MILITARY HOSPITALS,

ON A

PRINCIPLE, AND CONSTRUCTION, TENDING TO INTRODUCE

A more successful Treatment of the Sick.

TO WHICH ARE ADDED,

OTHER PAPERS CONNECTED WITH THE SUBJECT.

By STEWART HENDERSON, M. D.
DISTRICT STAFF SURGEON.

With rigid fibre, and with blood too dense,
And pulse too vigorous, EUROPEAN Youth,
New-landed on the hot West Indian shores,
Will soon fall victims to the YELLOW PEST:
While the CREOLEAN frame, languid and lax,
Escapes this dire disease, that massacres
The stout, and strong, the pride of British Armies.

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1808.

TO

HIS ROYAL HIGHNESS

FREDERICK

DUKE OF YORK AND ALBANY,

FIELD MARSHAL

AND COMMANDER IN CHIEF OF HIS MAJESTY'S FORCES;

A PRINCE,

WHO,

TO AN UNWEARIED ANXIETY FOR THE IMPROVEMENT OF THE ARMY,

UNITES A MOST BENEVOLENT, AND DISTINGUISHED REGARD TO WHATEVER IS SUGGESTED FOR PRESERVING THE HEALTH,

AND MELIORATING THE CONDITION OF THE SOLDIER;

A PRINCE,

WHO,

AMIDST NUMBERLESS ACTS OF CONDESCENDING GOODNESS, WAS PLEASED SOME YEARS AGO TO HONOUR THE AUTHOR IN

AN OFFICIAL COMMUNICATION,

THAT HIS ROYAL HIGHNESS ENTERTAINED

A FAVOURABLE OPINION

OF HIS SERVICES AND MERITS:

TO SUCH AN ILLUSTRIOUS FRIEND OF THE SOLDIER,

THIS LITTLE TRACT LOOKS UP,

AND NATURALLY INCLINES FOR PROTECTION,

AND IS THEREFORE,

MOST HUMBLY, BUT RESPECTFULLY,

INSCRIBED BY

HIS ROYAL HIGHNESS'

MOST FAITHFUL

AND DEVOTED SERVANT,

STEWART HENDERSON.

PREFACE.

IN these days of unexampled pressure and peril, it becomes the duty of every Briton to contribute his utmost efforts towards diminishing the burthens, and augmenting the security, of his country.

But more especially does it become a Medical Officer, who has devoted the largest, and best portion of his time to the service of his King, and Country, to communicate, without hesitation, or reserve, the result of his personal observation, and the fruits of his painful experience.

Animated by these considerations, I submit the following pages with the spirit of a man conscious of meaning well. Whatever may be their imperfections, I console myself with the hope, that they may possibly induce others of superior talent, to illustrate a subject of such national

importance, and so interesting to the feelings of humanity: In such case, without affecting any uncommon portion of philanthropy, I shall be most amply gratified.

Though zeal is not always prudence, and though in a situation *surrounded with so many* discouraging, *and* depressing *circumstances, I am not to be deterred, by any personal consideration, from discharging what I conceive to be a conscientious, and sacred duty.*

Little apology is necessary for republishing the facts and observations in the Appendix, which were originally inserted in that valuable periodical work, the London Physical Journal, in 1799; *and which are not only in unison with the object of this Essay, but prove likewise that my assertions are not vague or unfounded, but rest on the solid basis of* SUCCESSFUL experience. *Besides, they shew that my zeal has been equally ardent, and unremitting, in what has ever been nearest my heart; namely, the preservation of the health of our brave soldiers, and seamen, in torrid climes,*

where I have been a fellow-sufferer, but where, I hope, I have not suffered in vain.

In concluding this short Preface, I beg leave to remark, that though the enthusiasm, with which I confess myself to be invariably animated, when thinking, or writing, on this interesting subject, may have communicated some occasional warmth to my observations; I shall be much hurt, and deeply disappointed, if I have been betrayed by my feelings into any acrimony of remark, or impropriety of expression, in respect to any PUBLIC BOARD, *or* INDIVIDUAL, *in any department of the service. My first wish is to serve my King, and Country; my second, to avoid giving offence.*

Birmingham, Jan. 12, 1808.

SUGGESTIONS,

&c. &c. &c.

RECOLLECTION shudders at the dreadful mortality which prevailed among the British troops, during the last and the preceding wars. Diseases peculiar to those pestilential climates swept away their tens, and their hundreds, and their thousands, into one inglorious grave, "until even destruction sickened;" and what added to the calamity, these terrific massacres were among the best, and bravest, the most robust, and vigorous of our soldiers. The public papers of that period were crowded with a detail of death and depopulation, which more than once formed the theme of parliamentary lamentation and discussion. Patriots thought that our conquests in that quarter, however splendid, were dearly purchased by the loss of so many valuable lives. That pernicious pest, the YELLOW FEVER, was

known to baffle the boasted powers of medicine, and still seems to bid defiance to all the Sons of Æsculapius. This dire destroyer not only weakened the military force of the country, but by a necessary consequence, retarded the recruiting service; men being deterred from enlisting by a dread of being transported to climates where so many had fallen the victims of a disease, which no caution seemed able to prevent, nor art to combat.

Hence these islands were emphatically, and too truly, called the Grave of the British Army. These impressions being made on the minds of thousands who had lost their beloved relatives, or valued acquaintances, in that disastrous country, must necessarily tend to damp the constitutional courage, and extinguish the military ardour of any reflecting individual, notwithstanding the great advantages and very liberal encouragement held out by Government.

But as our West Indian colonies (styled by the great Lord Chatham "one of the Wings of

the *British Eagle*") must at all events, and at every risk, be protected by an efficient force, it becomes of the utmost consequence to adopt such measures for that important purpose, as are dictated not only by mature consideration, but by personal experience, and local knowledge of these dreaded climes.

BUT before I propose the means to be employed to combat, and weaken the powers of an enemy so destructive to the military, it may be proper first to enquire into the nature of this afflicting malady, and to notice the erroneous opinions which have gone forth regarding its origin; opinions which have only tended to prevent a rational prophylactic plan from being put in force.

The disease commonly termed the Yellow Fever, is the legitimate offspring of all hot climates where marshes abound. It has been described by authors under various denominations, *Bilious, Yellow, Remittent*, &c. but to multiply

distinctions without substantial differences, serves only to perplex and mislead; for it is found to be the same individual disease, under different modifications, depending on constitution, season of the year, and locality of situation. It is an *endemical* disease coeval with the discovery of these islands, and not a disease imported, or communicated by contagion, as has been erroneously supposed. In this opinion I am supported by the authorities of most respectable medical officers; of Drs. Pinckard, Jackson, M'Lean, and others, who were at the head of the British hospital staff in *St. Domingo,* and the other West Indian islands, during the last war, and who had the best opportunities of seeing the disease in all its variety of shapes. They all agree that it is a fever of the country, excited by marsh effluvia acting upon *exotic* bodies predisposed to such action by violent exertions in the sun, or the use of stimulating spirituous liquors. These causes combined seldom fail to produce the disease in its most virulent and malignant form, especially when it seizes the strong and vigorous, of dense and rigid fibre, from the age of 18 to 28 or 30, who may be said to be

above the standard of health. These are most frequently, and most rapidly destroyed by it; while we find that men naturally of a laxity of fibre, whose constitution offers less resistance to the propelling fluids, are not subject to the fever in its continued or dangerous form; and when it does invade them, it more commonly appears as a *Remittent*, or *Intermittent*. We find likewise, that those whose original density and firmness of fibre have been reduced to the appropriate standard for continuing healthy action under exposure to preternatural heat, as well as women, children, convalescents from former maladies, and those who have been reduced by the use of *mercurial remedies*, are less frequently the objects of its attack; and when it does attack them, it is commonly milder in its form, and less rapid in its progress. In these classes the state of the animal fibre, either from original conformation, or from fortuitous circumstances, more nearly approaches to that of the *Creoles* and *Natives*. As I find the opinions of Dr. Pinckard are so congenial with my own, I shall take the liberty of quoting a few remarks from his valuable notes published on the West

Indies. "That the presence of contagion is in no degree neeessary to the produetion of this fever," he remarks, "that its invasion is governed by eircumstanees very opposite to all the known laws of eontagion; for in proportion as the body approaehes the *Creolean*, or relaxed structure, so is it able to support the change of temperature, and to resist the fatal effeets of that seasoning malady, the *Yellow Fever*. If the constitution, either from natural organization or from long residence, be assimilated to the elimate, i. e. if it be redueed to the common standard of the *Creoles*, it has nothing to apprehend from the disease; but if it be not, the fever will most assuredly make its attaek without waiting for any sueh eause as contagion. It is not a law of contagion to make its attaek upon the most robust and vigorous people; more commonly it assails those of weak and tender fibre.

Were any given number of strong healthy men, and the same number of children, to be exposed at the same time to the influenee of the contagion of *Small Pox*, *Meazles*, or *Scarlet Fever*, common

observation informs us, that the children would be found to be most susceptible of the impression, and attacked in the greatest number; but the very reverse of this would be the case, were they to be exposed in a similar manner to the cause producing the *Yellow Fever*. The men would be found to be the most susceptible, and a greater proportion of them would fall victims to the disease.

By way of further proof, he mentions a remarkable fact, which every one who attends our hospitals must have observed, and which, more than all others, seems to militate against the doctrine of the *Yellow Fever* being originally a contagious, or becoming in the course of its progress an infectious malady, viz. that among the multitudes of black men and women whom I have had occasion to see employed constantly in the hospitals, and who have executed all the menial duties about the sick, the dying and the dead, I never yet knew even a single instance of either male or female taking the disease. Perhaps no

one will contend that this would have happened, had the hospitals been equally crowded with patients in *Small Pox*, *Measles*, *Scarlet Fever*, the *Common Jail Fever*, or any complaint decidedly infectious.

The Yellow Fever prevails most commonly, and most extensively, at the decline of the wet season of the year, that is, in the months of November, December, and January; and its rage will be in proportion to the quantity of rain that fell during the three preceding months; these being what are called the *Hurricane Months*. At the high period of the wet season the ditches and canals are full, and the brooks and rivers fluent; so that the noxious exhalations are neither so readily formed, nor so easily taken up into the atmosphere; and in the dry season these deadly vapours are either chased away by the breeze, or rendered effete by the intense rays of the sun. But during the intermediate period, at the decline of the wet season, every circumstance tends to favour their production, and to promote

their diffusion and suspension in the surrounding air.*

We likewise find, that the fever is most readily generated in *new* colonies, where the land is only

* THOMSON, in his *Seasons*, deseribes with mueh feeling, elegance, and aeeuracy, the eauses and effects of these noxious exhalations.

> When o'er this world, by equinoetial rains
> Flooded immense, looks out the joyless sun,
> And draws the eopious steam from swampy fens,
> Where putrefaetion into life ferments,
> And breathes destruetive myriads; or from woods,
> Impenetrable shades, recesses foul,
> In vapours rank and blue corruption wrapt,
> Whose gloomy horrors yet no desperate foot
> Has ever dared to pierce; then, wasteful, forth
> Walks the dire *Power* of pestilent disease.
> A thousand hideous fiends her course attend,
> Sick nature blasting, and to heartless woe,
> And feeble desolation, casting down
> The towering hopes and all the pride of man.
> Such as of late at St. DOMINGO quenehed
> The *British* fire. You, gallant SIMCOE, saw
> The miserable scene; you, pitying, saw
> To infant weakness sunk the warrior's arm;
> Saw the deep racking pang, the ghastly form,
> The lip pale quivering, and the beamless eye
> No more with ardor bright: you heard the groans
> Of agonizing ships, from shore to shore;
> Heard, nightly plung'd amid the sullen waves,
> The frequent eorse; while on each other fixed,
> In sad presage, the blank assistants seemed,
> Silent, to ask, whom fate would next demand.

partially cleared of its wood, badly cultivated, and the half-drained soil left to exhale its noxious vapours into the surrounding atmosphere. In the older colonies, *Barbadoes* and *Antigua*, where the forests have been long cut down, the land brought under general cultivation, and its surface more opened to the breeze, it is found to be less prevalent, and is seldom or ever known where *marsh miasma* (the true *pabulum* of the disease) does not exist.

Next to fever, ulcers on the legs prove the severest scourge of the troops in the West Indies; but that the climate is the principal cause of these, I must beg leave to dissent from Dr. Pinckard.

He remarks, while an English soldier has lingered and died, from only a slight scratch or excoriation, the *African* and the *Creole* have rapidly recovered from the widest and most perilous ulcers. Indeed the recovery from sores and ulcers in this ungenial climate, is as successful among the Blacks as it is the reverse among

the Europeans; the examples in proof of which are abundant. But as we find ulcers equally prevalent among soldiers and seamen in the most salubrious foreign climates, and frequently in England (particularly on board ships) surely this fact militates against Dr. Pinckard's opinion.

No climate in Europe can be more congenial to the British constitution than the Cape of Good Hope; and yet our soldiers and seamen at that place, when I was there last war, were most dreadfully afflicted with ulcers, which produced as fatal effects as in the West Indies; a fatality, occasioned, in my opinion, by the operation of the same causes, a deficiency of vegetable aliment, and the abuse of ardent spirits, to which both soldiers and seamen had too much access. Among the inhabitants of the Cape, ulcered legs are totally unknown, nor was any of the officers attacked with this complaint, which would not have been the case, if the climate had any concern in its production; surely some of them would have experienced its predisposing influence. Besides, we find that even in the West Indies the

officers, although they suffer perhaps in proportion with the soldiers from the Yellow Fever, yet seldom, or ever, have a sore on the leg, an additional proof, that this distressing malady is not imparted by the climate, but, as I have already observed, by a deficiency of vegetable food, combined with the irregularities which soldiers are guilty of, in drinking spirituous liquors to excess. This baneful practice brings on such a state of the solids and fluids, that the slightest scratch will, in the course of a few days, degenerate into the most malignant ulcer, and often prove fatal in spite of the most powerful remedies.

PROPHYLACTIC, or PREVENTIVE Means.

Having in the preceding pages endeavoured to shew that the dreadful, depopulating disease, commonly termed the Yellow Fever, is not of foreign origin, but a disease coeval with the discovery of the West India Islands, and that it is not of a contagious or infectious nature (as is proved by facts founded on experience and attentive obser-

vation) I must at the same time allow, that a disease decidedly infectious, namely, the *Jail, Hospital,* or *Ship Fever,* or in the language of physicians, the *Typhus,* was imported into several of the Islands early in the war, particularly into *St. Domingo,* as related by Dr. Jackson in his book on the Diseases of the Troops in that Island. In that devoted place this disorder, from a number of concurring causes, was aggravated to a degree of malignity seldom seen in Europe; but a hot climate being ill calculated to generate infection, or keep up its virulence, and activity, the disease soon entirely disappeared, while what is termed the Yellow Fever lies dormant only for a time, waiting for fresh, unprepared bodies, on which to exercise its intermitted vengeance. Such as are newly arrived from Europe it prefers to *Creoles, Negroes,* and those who by a long continued residence, have become *acclimates*; but even among those unhappy Europeans, who chance to suit its appetite, it still has its partialities, for the most healthy, and the most robust, and in general, those who are the most subject to great exertions, and the high degrees of temperature, joined to

the immoderate use of ardent spirits, are sooner seized, and more rapidly destroyed by it, than those of laxer fibre, or delicate constitutions, those who have not attained their full growth, or those who have had the opportunity of becoming gradually seasoned to the climate. These are not so susceptible of the disease, and when attacked, have it in a milder degree.

These facts being fairly established, and the objeet being of great magnitude, not only in regard to humanity, but the safety of our West India Colonies, and the preservation of many valuable lives, any measures that have a tendency, however remote towards those important purposes, will, I humbly trust, lay claim to some consideration from Government, although suggested by a Medical Officer who has not had the good fortune to obtain high rank in the Service, but who has had the honour to serve his King and Country in his professional capaeity (both by sea and land) for *thirty-one years*, in every quarter of the Globe, and who can produee the most honourable testimonials of his conduct and services, from officers of the highest rank and eonsideration.

Upon the principles above mentioned, it would be desirable (but I am afraid not practicable) to make a selection from the army in general of troops for the protection of our West India possessions; such troops to consist of men not under 28 years of age, and who have been two years at least in the service. At all events, the Field Officers should have served some years in a tropical climate, as well as the rest of the Staff, and more particularly the Surgeons; but as it might be deemed a hardship to send officers to the West Indies whose regiments were not ordered upon that service, additional pay, and other advantages, might be granted.

And from the principal officers being habituated to a hot climate; and from their being practically acquainted with the salutary regulations, which they would strictly enforce, the saving to the nation in men and money would, I humbly conceive, greatly overbalance any additional allowances, which it might be deemed expedient to grant to such officers, for the purpose of rendering their situations both comfortable, and desirable.

From what has been previously observed, the great desideratum seems to be, a gradual assimilation to a hot climate,* and to effect this, Gibraltar was considered as a place well calculated for that purpose, and which, in time of peace, might furnish a sufficient number of men for the defence of our West India possessions. But should Government have abandoned that plan; what I am now to propose, I am convinced, would prove of equal utility. The remedy I humbly, but earnestly recommend for that salutary purpose, is MERCURY; a *remedy*, which has the power of reducing the system to any degree required, and from which, when judiciously, and gradually administered in small quantities, not the least bad effects can ensue. On the contrary, it will most effectually remove that rigidity of the solids, and density of the fluids, so peculiar to the *European* constitution (and still

* It is probable, that our troops might be rendered nearly as effective for service in the West Indies, as in Europe, were it possible, in all cases, to prepare them for the climate by slow and gradual approaches; as, for instance, by first letting them serve, for a time, at Gibraltar, and afterwards employing them, for a year or two, in the more Windward Islands, such as Barbadoes or Antigua, before they were sent upon duty to the other Colonies. Dr. Pinckard's Notes on the West Indies.

more so to the *British)* which renders them so liable to be attacked by the fever in its most malignant form, and to be so rapidly destroyed.

Mercury will be best given on board ship, in form of pills. The quantity will depend on constitutional habits; blood letting may be freely used, and laxative medicines given in young pletheric bodies, previously to the use of the mercury. Should any objections be made by the men to the use of those medicines when in health, I have no doubt but they would be removed by the example and persuasion of the officers. The mercurial process should be under the management of a medical officer, who will take care to regulate, and confine its operation to a slow and gradual diminution of the animal fibre, without in any degree injuring the health: and by intermitting the remedy, when necessary, neither salivation, nor any other violent effects, will ensue, which might enfeeble too much the vital powers.

Making the latitude of *Madeira*, or entering the *Tropics*, should be the signal for commencing

the use of mercury, which should be continued until the arrival of the troops, which probably may be in about four weeks, and by that time their constitutions will be charged with the mercury to such a degree, as to have produced that laxity of structure, which is found in the *Creoles* and in the *Natives* of the West Indies, and those who by a long residence have become *acclimates*, and which has been found to secure them from any dangerous attack of the dreaded Yellow Fever.

Before the troops embark, they should be inspected by a medical officer of observation, who has acquired experience in the West Indies, and who will be able to point out such men as may not require the mercurial process. But I imagine there will be but few in a regiment, to whom it may not be necessary to administer it, and to whom it may not be administered with safety. The best time for the troops to leave England, is early in January. They will then arrive about the latter end of February, or the beginning of March, the most favourable time, when the marshy

exhalations have beeome effete, and the sea breezes generally blow in full force.

A eode of regulations, sanetioned by Government, and put in general orders to to be strictly obeyed, for preserving the health of the men on the passage, should be delivered to the eommanding officer of the troops on board eaeh ship. Should any sickness afterwards pervail, an enquiry might be made to aseertain, whether it proeeeded from unavoidable causes. These salutary regulations, now so well understood, should relate to cleanliness, ventilation, bathing, amusements, and diversions, keeping the decks below as free from moisture as possible. Plenty of potatoes, mustard, pepper, riee, onions, pickles, vinegar, lemon juice, and essenee of spruee, should be liberally supplied at the expenee of Government. By virtue of those auxiliaries, the bad effeets of living on a putreseent diet of salted meat will be prevented.

When the troops are disembarked in the West Indies, another eode of regulations, in like manner, should be furnished to the commanding offi-

cers of each regiment, and so arranged as not possibly to be evaded. Those regulations should relate to the time, and hours of field exercise, the management of the *cantine*; the preventing drunkenness and irregularities of every kind; the marketing business, and cleaning of the barracks.

A sufficient quantity of vegetables should be allowed, and regularly used with their animal food, which is often salted; yams, rice, joined with the peppers of the country, should bear a considerable proportion. A deficiency of vegetables is the principal cause of the malignant ulcers on the legs of soldiers, which prove so fatal to so many; and if any rum is allowed, it should be served diluted; a warm breakfast of coffee or cocoa is a great preservative of health in that climate. Commanding officers will have great merit, if they can prevent the immoderate use of that pernicious spirit, *new rum*, to which the soldiers have unfortunately too great access, and which is found to be one of the leading and predominant causes of the sickness, and mortality, which make such havock in their ranks.

In my printed letter to the officers of the army under orders for the West Indies in 1795, I could not avoid remarking, " that the greatest and first " preventives were temperance, and regularity of " living; but unfortunately in that country there " are few inducements to quit the fascinating " bottle, unless you possess the most vigorous " resolution, and are well convinced of its baneful " effects: no operas, no plays, and little society, " except among yourselves. It therefore behoves " commanding officers possessing judgment and " experience, to discourage too free an enjoyment " of the bottle, by authority, example and precept. " I do not mean to insinuate that officers drink " to excess, but I may venture to say, they fre- " quently indulge too far in a country, where it " cannot be done with impunity."

The superior degree of health enjoyed by the troops stationed in barracks in the interior and elevated parts of the country, to those who are in barracks in towns, or on the sea coast, claims the most serious consideration on the part of Government.

The hospitals in the West Indies are ill adapted to give efficacy to medical aid;* and as we find from long experience, that sickness will at times prevail, in spite of every human precaution, it becomes a wise and judicious measure, to have those useful and necessary institutions constructed on a proper principle, and in a situation favourable to the restoration of health. The plan of hospitals for the Cape of Good Hope, the outline of which I have given in the subjoined paper, would in my opinion answer equally well, if not better, for the West India Islands, regard being had to the climate and local circumstances.

The hospital intended for the Cape (a salubrious climate) was supposed sufficient to contain the sick of six or seven thousand men; but in the West Indies, where greater sickness may be expected, an hospital of the same size, would, perhaps, be required to contain the sick of half that number.

Dr. Mosely on Tropical Diseases, page 187, observes, That at Jamaica, during the American war, he lost more value in men at Castile Fort, and at Uppack, in three months, from the miseries of the hospitals alone, than would have been adequate to the expence of erecting a proper one, for all the troops in the Island.

The sick in the hospitals should be under the care of their own regimental surgeons, subject to the occasional visits of an experieneed hospital staff officer, as physician and inspector, and a surgeon to the forees, stationed in each island, both of whom, as well as the regimental surgeon, should have previously served in a medieal capacity in the West Indies, or some other tropical elimate, and have risen progressively in the service. And as every choiee of situation is to be had in those islands, the hospital should be plaeed on an eminenee, clear of wood, where plenty of water is to be proeured, and not within at least two miles of a marsh.

If sueh a situation can be found near the barracks, it will be convenient, but that circumstance is not very material, as the sick can, with safety and facility, be conveyed to the hospital in a carriage of a very simple construction, named a *dooley*, or inferior sort of *palanquin*, which is used in India for the same purpose, and which can be carried by the blaek pioneers attaehed to the regiment.

The physicians to the forces, more particularly in the West Indies, should have served in a tropical climate, and should have been advanced by regular gradation in the service to that situation, a situation which should invariably be the reward of merit and long services. But unfortunately, to the disappointment of deserving medical veterans, that situation has been for a series of years, and still is, held (with two or three exceptions) by young and inexperienced men, it being their first appointment in his Majesty's service. Of this description were the physicians nominated during the last war to take charge of the sick of the British army in the West Indies. Strangers to the service, destitute of local knowledge, inexperienced in the diseases incident to soldiers in a tropical climate; unaccustomed to the fatigues and hardships of a military life, and not inured to a hot climate, they were among the first who were disordered, and instead of being useful to the sick soldiers, required medical assistance themselves. In the course of a few weeks, most of the physicians either died, or were rendered totally useless; a circumstance well known to the medical inspectors

of hospitals. These having risen progressively to their rank in the army, and having been employed in different climates, and accustomed to the hardships of a military life, not *one* of them died, or as I am well informed, was rendered incapable of doing his duty for a day, during the whole time he remained in the West India Islands, not, even in the pestilential St. Domingo. They are living witnesses of this important fact, which, I think, strongly demonstrates the necessity of selecting physicians to the forces from regimental surgeons, whose knowledge has been matured by the experience of many years: for where one case occurs that requires their *surgical* aid, fifty, I may say, occur that require their *physical* assistance; and if they are not qualified to be physicians to the forces, there may be some impropriety in allowing them to officiate in that capacity, in addition to their other regimental duties.

In the Royal Navy there is a regulation, that no person shall be a physician to the fleets or hospitals, who has not been at least *five years* a navy surgeon. If the health and lives of our

brave seamen are entrusted to the eare of physicians promoted from that line in the navy, and as this usage is found to be attended with the most beneficial effeets, I do not know any good reason why a similar regulation should not exist in the army.

It eannot be denied, or even doubted, that there are many surgeons in the army, who have had equal professional advantages, and equal experienee with surgeons in the Royal Navy.

But that *post of honour and emolument*, is, in the army, generally filled by men who are strangers to the service, and who have been plaeed over the heads of experienced army medieal officers; an arrangement that must be grievously felt, and neeessarily tend to damp their ardour for professional improvement, and weaken their exertions for the good of the serviee. Add to this, it generates jealousies, whieh eannot, in any department, tend to the advantage of the public. Those phyśicians, it is true, beeome lieentiates, or members of the London Royal College of Physieians,

before they receive their appointment in the army, and they may possess profound medical erudition: but it has been fatally experienced, that no course of lectures, no reading, no private study, can qualify a man for medical service in a hot climate; practice, experience, and observation, joined to a well grounded professional education (I humbly conceive) can alone constitute a good physician. The circumstance of being a licentiate of the above mentioned college, is found to be a potent recommendation to the appointment of physician to the forces; and the president of that learned body, from his official situation as physician general, presides likewise at the army medical board.

But far be from me the most distant intention to convey the slightest suspicion that any self-interest, any party consideration, any sordid, or sinister motives, ever influenced, or ever will influence, his conduct in his recommendation to the appointment above mentioned. On the contrary, from his unprejudiced and enlightened mind, and his very high and exalted character, I am fully persuaded, he is actuated solely by a firm and

conscientious belief that licentiates of the London Royal College of Physicians, are persons best calculated to fill the important situation of physician to the forces.*

I trust I shall give no offence by observing, that the well-grounded expectation of being recommended as physician to the forces operates as a strong incentive to a young graduate, to incur the expence of becoming a licentiate of the above far famed college, which is supposed to possess the faculty of imparting such transcendant knowledge to its disciples. But notwithstanding this prevailing idea, and notwithstanding its *high sounding title*, the young *academicus* will find many obstacles to encounter in his road to private practice; for people are not much disposed to confide their health, their comfort, and their lives to young and inexperienced physicians, however decorated with *academic honours*. This is the conclusion of common sense, and common reflec-

* It may be worthy of remark, that among the physicians to our fleets, and Royal Navy Hospitals, there is not, I understand, a licentiate, or member of the above named College.

tion; and if it is so applicable to medical practice in *civil* life, *à fortiori* must it apply to military service, when considered in a political light, when the lives of such numbers of men, so valuable to the state, and so difficult to be procured, are at stake. But no sooner is the above appointment gained; no sooner is the young *Galen* invested with the title of physician to the forces, than all the obstacles which present themselves in *civil* life, instantly disappear, and he is launced into full practice, the consequences of which require no comment. He instantly receives a very liberal subsistence, and perhaps in the course of a few years is permitted to enjoy *otium cum dignitate*, or in other words, to retire with a handsome annuity, beside having acquired a celebrity and sanction to his professional character, the consequence of the high and dignified situation of physician to the forces. While he is steering with a brisk and favourable gale towards FORTUNE and FAME, many of the army medical officers, who have been in fact wedded to the service; who have spent the prime of their days in the promotion of its interest; who have had equal pro-

fessional education, combined with superior experience; and who have undergone all the toils, privations, hardships, and personal dangers of a military life; these have only been able to obtain a situation barely superior in point of emolument to the lowest medical rank in the army. The pay of the regimental surgeons (the line from which they were promoted many years ago) as also that of the surgeons to the forces, with whom they had hitherto been classed in the above respect, has been considerably increased by a regulation of May, 1804, but theirs has not been raised since the reign of Queen Ann, and is now reduced 10 per cent. by the Income Tax, which at this period, does not leave them adequate means of subsistence. And at the close of their services, or when put upon half pay, they must retire into some obscure corner of the United Kingdom, with means ill calculated to alleviate the infirmities of advanced life, to support a mind depressed by unmerited misfortunes, a constitution shattered, and health irreparably injured, by long, laborious services, and the vicissitudes of climate. These evils (even if the good of his Majesty's service was not con-

cerned) I am convinced, to be remedied, require only to be known, for I am sensible, that it is far from the intention of Government, far from the wish of His Royal Highness the Commander in Chief, to suffer any invidious distinctions, or wound the feelings of veteran officers in any department of the service; but on the contrary, to give energy to the streams of justice, that they be not obstructed, but administered impartially; and like the vital blood flow through every part, carrying with them comfort and refreshment, especially to those, who have been diligent and faithful servants to their King and Country.

But to return (from what I hope will be considered as a pardonable digression) to the subject of this essay, I am happy to have it in my power to assert, and to prove, that by salutary regulations, steadily enforced, and discipline assisting medical exertions, the health and lives of men may be preserved, even in the ungenial tropical climes, perhaps to as great a degree (if not greater) as in the most salubrious country in Europe.

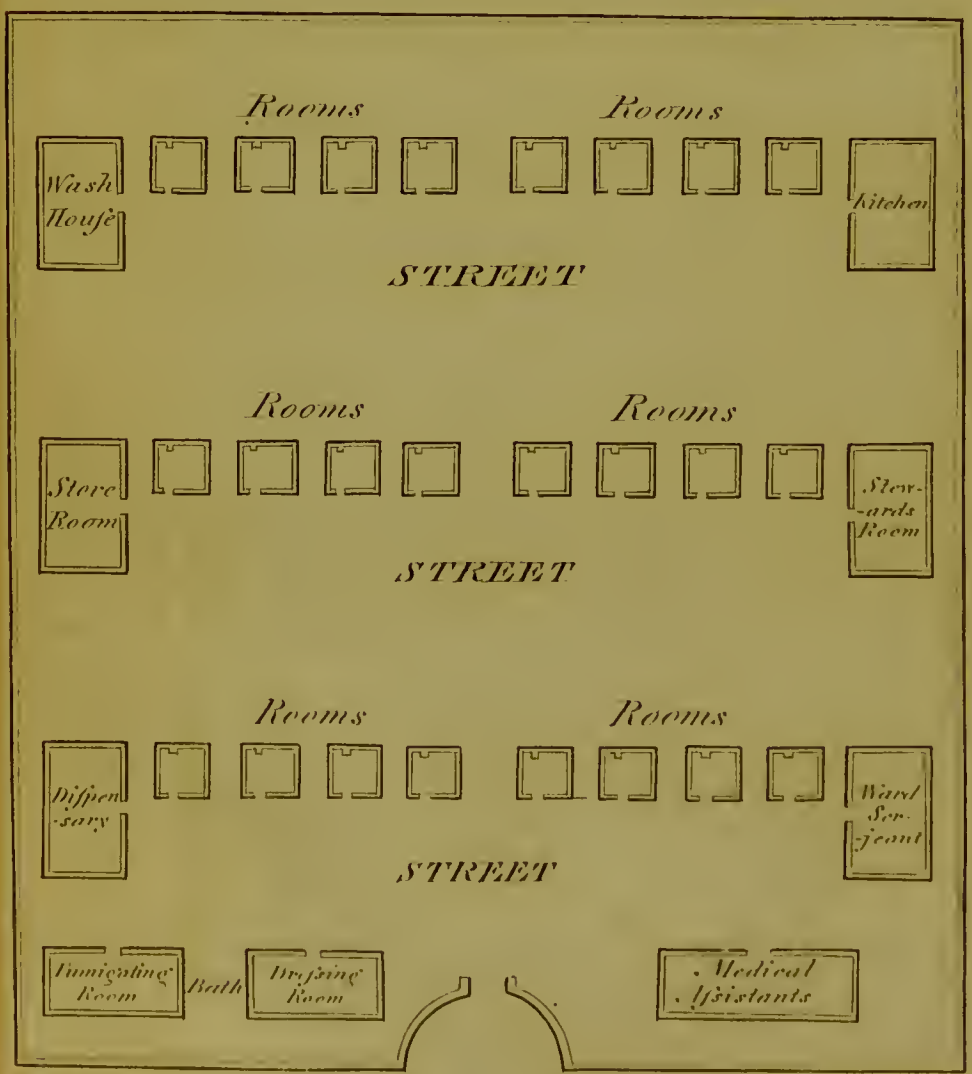
In proof of which I beg leave to refer to the annexed paper and table relative to his Majesty's ship Astræa, for three years on the Jamaica station.

Lastly, let me be allowed to remark, that many valuable plans and judicious suggestions have been known to fail from their execution being committed to persons not sufficiently acquainted with their principles or practicability; but more frequently perhaps, from the baleful influence of envy and jealousy, endeavouring to frustrate the schemes they did not form. But suppose that none of these causes interfere, is it likely that any one will feel so lively an interest in the success of a plan as the man with whom it originated. Will he not cherish the offspring of his own intellect with a zeal and enthusiasm the most likely to ensure its efficacy? Deeply impressed with these truths, should the above suggestions be deemed of sufficient importance to attract the attention of Government, and should my services be wanted on such an occasion (if my constitution and impaired health would permit) I would, without

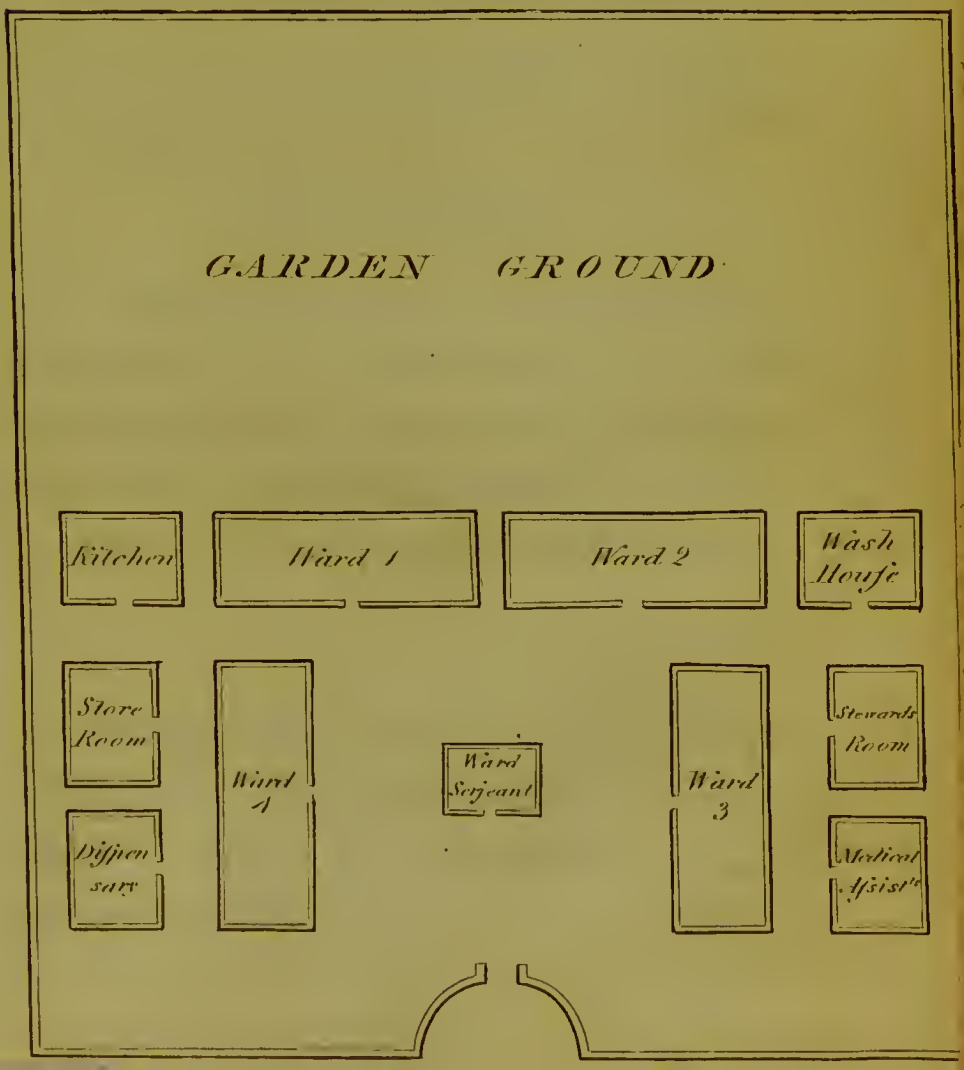
hesitation, accompany any body of troops to the *West Indies*, revisit those torrid regions, notwithstanding my long services and sufferings, in confident hope of proving that these suggestions are founded upon rational principles: guided by practical knowledge, and attentive observation. And that the remedy herein offered, with its necessary auxiliaries, would effectually accomplish the important object proposed, in rendering our *military* force in the West Indies more *effective*, by weakening the powers of that insidious, and hitherto destructive FOE, the *Yellow Fever*, thereby disarming the climate of all its terrors.

And the conscious satisfaction arising from a well grounded hope, of being instrumental to a measure of such extensive utility to my country, as well as to individuals, would invigorate all my faculties of *body* and *mind*.

tline of a Plan for a Military Hospital, to
tain 120 Patients in Acute & Infectious disease: Each
ient to have a seperate apartment 7 feet by 8, height 10
: the floor brick or Stone; & frame of the bedsteads
n. Four feet distance between the rooms, & the streets
feet wide: The patients to wear the hospital dress: untill
r situation renders it proper for them to be removed to the
valesent Hospital, adjoining: Nothing to be in the rooms
can retain, filth, vermin, or infection. A small ventilator in
apartment, & a window over the door opposite to another.



Outline of a Plan for a Military Convalesc
Hospital, to contain 160 patients, divided in
4 wards, each 120 feet in length, 18 in Breadth
& 14 high, the floor brick or stone; & frames of th
bedsteads Iron, Ventilators in each ward.



AN INQUIRY

Into the Causes which produce Disease among the Troops at the Cape of Good Hope, with a View to discover the most effectual Means of Prevention;

TO WHICH IS ADDED,

The Outline of a Plan of Military Hospitals, on a Principle and Construction tending to introduce a more successful Treatment of the Sick.

THE following investigation was suggested in consequence of his Majesty's troops being for some time very sickly in this quarter, and erroneous opinions having gone abroad, respecting the cause of the sickness and mortality which ensued.

The plan of military hospitals, of which I here give the outline, is on a principle and construction different, I believe, from any yet established in Europe.

The want of proper military hospitals has been severely felt, I may say, both at home and abroad; but since his Royal Highness the Duke of York filled the important station of Commander in Chief, those useful national institutions which reflect so much honour on a country, are erecting, I understand, in different parts of the kingdom.

In the latter end of 1793, a regiment* arrived at Plymouth, from Cork, in a very sickly state, having upwards of three hundred men ill of a malignant jail-fever. The best and only accommodation that could be had, was a large stable, ill-calculated to contain such a number of men, labouring under infectious disease, and in a crowded situation, if proper ventilation, and hospital-necessaries cannot be procured, medical efforts avail but little. As might be expected, every symptom was aggravated, and the effect of medicine counteracted. From what I have observed in the four quarters of the world, where I have been employed on actual service, in time of war, the places allotted for, and named hospitals, appeared to me only adapted for men to die in,

* The 40th.

not to recover from disease; nor do I think that the great sickness and mortality which have happened to the British troops in different parts, particularly in the West Indies, and on the Continent, have actually arisen from the irremediable effect of climate, or unavoidable hardships of service, but from causes which I think might have been greatly obviated, if not entirely prevented: it is therefore to be hoped, that we shall profit from experience and past misfortunes, by adopting those means of prevention, which I am well convinced are within our power, requiring only the aid and energy of the legislature, to appoint proper officers of health, establish lazarettos, with the observance of quarantine, which are found so necessary in other countries for preventing the introduction of infectious disease, as well as having hospitals constructed on a proper principle; and that the medical department in these countries be filled by men of observation and experience.

Had these precautions been adopted, and attended to in the West Indies, in my opinion, the saving to the nation, in men and money,

would have been immense. We can only lament, that they were not put in practice; as they would, in all probability, have effectually destroyed the contagion at Grenada, and prevented the importation of that pestilence into the other islands, in the manner related by Dr. CHISHOLM, in his book on the Yellow Fever.

I submitted a plan to Government in 1791 (which I shall insert at the end of the following pages) for preventing the introduction of infectious disease into the garrison at Chatham, which was approved of by the Surgeon General, Mr. JOHN HUNTER, who strongly recommended the adoption of it. I was afterwards informed, that it had been adopted by the Secretary at War. To be satisfied on this point, I went to Chatham, and found that a ship indeed had been taken up, but not appropriated for the purpose of prevention (the important object I had in view) but for the reception of the sick, of different complaints, as well as prisoners. General Fox, the commanding officer of the garrison, at the same time informed me in writing, that he would never be induced

to recommend soldiers of any description to be put on board ship, except such as were prisoners, merely for the sake of security, when there were not sufficient prisons on shore.

As there is no building unconnected with the garrison, for the purpose of prevention, and the hospital being a part of the barracks, it is evident, from the description of men brought in, that infection must be, I may say, daily introduced; and, I much fear, a portion of it exported to different parts of the world, by every detachment sent from thence, notwithstanding the prudent and judicious measures ordered to be pursued by the commanding officer, as well as the attention paid by the gentleman who superintends the medical department—but medical men can do no more than recommend. However, since the publication of my printed letter, in January, 1795 (addressed to the officers of the army under orders for the West Indies) on the means of preserving health, I find that certain articles of diet and necessaries for the sick, which I particularly recommended in that letter, are now supplied at

the expence of Government, for the use of the troops on board; and I can affirm, that the most beneficial and salutary effects have since been experienced, by the arrival of some regiments at the Cape from England, without having any sick; the consequence, no doubt, of prevention being better understood and attended to.

Travellers who have visited this part of Africa, for the purpose of investigating the Natural History of the country, speak with rapture of the salubrity of its air and natural productions. I think it will be found, upon inquiry, to merit the most favourable opinion. The face of the country, for a considerable distance (except the land which forms the Cape) is rather low; but open, and well cultivated, of a sandy and marly soil, which soon absorbs the rain, thereby preventing the noxious exhalations, so productive of sickness in hot climates. The air, except a few months, may be called temperate; the atmosphere is seldom loaded with moisture, but possesses a degree of elasticity not often felt in any other country; and although Fahrenheit's

thermometer, during the summer months,* ranges from 80 to 90, and frequently a considerable variation is suddenly experienced; yet from the dryness of the atmospheric air, and a brisk circulation of it being kept up by the prevailing south-east winds, the constitution suffers little from relaxation. Invalids from India, labouring under complaints of debility, the effect of great heat, soon recover their strength here, by the temperate and bracing air of the winter months; and a further proof of its salubrity, are the florid and healthy looks we perceive in the Dutch inhabitants, especially those who live in the country, and are not enervated by luxury and indolence; though it is remarked that there are not many instances of longevity among them, owing in a great measure to their habits and manner of life, yet they are happily exempt from many of those endemic and epidemic diseases which rage in other parts of the world, and annually carry off great numbers. The small pox, measles, remittent, and intermittent fever, and that most fatal of all

* November, December, January, and February.

diseases, the jail, hospital, or ship fever, which destroys so many of the human species in every part of Europe, are never generated here, and are unknown, but when introduced; which, unfortunately for the natives, has sometimes happened. We likewise find, that neither the inhabitants or officers are attacked with the diseases which prevail among the soldiers; and it is a singular circumstance, that not an officer of the army or navy has died of disease contracted here, since the British forces arrived at the Capè (during a period of three years) which I think clearly proves that no noxious quality exists in the air of this country, which has been by some imagined, and erroneously blamed, as the cause of the malignity of the disorders, and the many deaths that have occurred in the General Hospital. We must therefore look for other causes than those assigned.

The natural productions for the use of man perhaps exceed in variety most parts of the world. At that season of the year when great heat prevails, nature has made ample provision to lessen

its influence on the human body, by the abundance of sweet acid fruits (European and Tropical) of which instinct and our reason dictate the use.

Upon the whole, considering its situation, climate, and natural productions, so far from being deemed unhealthy, it may more properly, in my opinion, be styled the Montpellier of the southern hemisphere.

The diseases which prevail among the soldiers are: fever, dysentery and ulcers. The principal causes seem to be the unlimited and immoderate use of ardent spirits, want of proper diet, cloathing, and bedding.

There is, no doubt, in the human body, a constant tendency to putrescency; more especially in a hot climate, producing various morbid appearances; and this tendency will be increased in proportion to the nature and quality of our food. Men using much animal food, without a due proportion of vegetables, soon contract diseases of a putrid nature; and when assisted by

that powerful agent, and destructive poison, new brandy, which the soldiers have so much access to, cannot fail to produce such changes, both in the solids and fluids, as to aggravate those diseases which, from other causes, have incidentally come on.

In a constitution thus previously prepared, it is easy to conceive, that the smallest scratch or wound will degenerate into an ulcer; and if seized with fever or dysentery, the worst termination may be expected.

I therefore consider the immoderate use of ardent spirits to be the great leading cause not only of disease, but those frequent punishments which have proved fatal to many of the soldiers, from the bad state of their constitutions, and foul air of the hospitals. In my printed letter already mentioned, I gave an instance of what happened in the southern province of India, when there was no arrack for the troops in camp. The sick considerably decreased, although the fatigue of duty was great, and the season unfavourable;

but a few days after, receiving a supply of that liquor from Calicut, the sick-list again returned to its usual standard.

The want of flannel waistcoats and bedding in barracks has assisted in producing disease, particularly the dysentery. The fever is supposed to have been introduced from the ships, but may likewise be generated in the barracks, unless the greatest care is taken to preserve cleanliness and ventilation.

Having endeavoured to shew, what are the causes of disease among the troops, it is next to be considered in what manner those evils may be obviated.

Many difficulties arise on this head, which, perhaps, can only be removed by the strenuous support and exertions of commanding officers. The thoughtless set of men which the generality of soldiers are found to be, with respect to what concerns their health, should make them be considered and treated as children; obliging them

to conform to those regulations, which have been found to be most salutary, and precluding them as much as possible from obtaining what is pernicious.

Cleanliness, not only in their persons, but in and about the barracks, ought to be the first consideration; all filth, dirt, and offal of animals (in which the Cape so much abounds) should not be permitted to be left on the ground, but thrown into a pit, and covered with earth.

The barrack-rooms should be frequently white-washed, and no obstructions remain to prevent the free circulation of air.

To guard against the variation of the temperature of the atmosphere, and chill of the night, the men should be obliged to wear a flannel waistcoat next their skin, which ought to be frequently changed.

They should have bedding, and sleep in hammocks, or on cot-frames, at least two feet above the surface of the floor.

They should have two regular meals a day. For breafast, tea, coffee, or rice gruel, which ever can be had at the least expence; and as they have no beer, as in barracks in England, this might be granted in lieu thereof. In the West Indies, and other climates, a hot breakfast has been found most conducive to health. For dinner, beef, or mutton, made into soup, with a proportion of vegetables, and seasoned with capsicum, the pepper of the country: a cabbage would also be daily necessary for every six men: but as a soldier's pay may not be adequate to purchase a sufficiency, might not the public grounds, or waste land, be cultivated, for the raising of vegetables for the use of the soldiers? or it might become an object of Government to make some allowance for that salutary purpose; which trifling expence, I am convinced, would in the end be greatly over-balanced, by a considerable reduction of hospital-expences, and the preservation of many lives.*

* Since this inquiry was drawn up, the soldiers have had their pay increased, by the recommendation of his Royal Highness the Commander in Chief; in consequence of which, they are abun-

By attention to a proper diet, their constitutions would be more able to resist the baneful effects of that destructive poison before alluded to (new brandy) the use of which it is found so difficult to prevent, while at the same time their diseases would be of a less malignant nature.

To prevent as much as possible the use of that pernicious spirit, so destructive to the health and morals of the men, let there be no house in the town licensed to sell wine or brandy to the soldiers; and let a tax be laid on the retailer of the latter article, so as to prevent the soldier from being able to purchase it. Every regiment should have a canteen near the barracks, to sell nothing but wine, subject to the inspection of an officer, to see that it was of a good quality, and every precaution taken to prevent abuses.

dantly supplied with vegetables, and every necessary for preserving their health.—This salutary measure, joined to the judicious regulations ordered to be pursued by Major-General Dundas, the Commander in Chief at the Cape, had a wonderful effect on the health of the army; for many months there was not one medical patient in the General Hospital for every physician there on the staff.

When a fever of an infectious nature has been introduced from ships, or generated in the barracks or Hospitals (which frequently happens, when they are not sufficiently ventilated, and too much crowded) the most effectual means should be employed to eradicate it, and prevent the infection spreading. A ward should be particularly appropriated for the reception of those cases: all their cloaths, bedding, &c. should be completely fumigated, as well as their bodies, by a mode lately recommended by a very ingenious and eminent physician, Dr. CARMICHAEL SMITH, which is said to have answered most effectually in a highly infectious fever, which prevailed in some prisons and ships in England.

By attention to ventilation, cleanliness, proper diet, cloathing, bedding, and preventing the use of ardent spirits, the most beneficial and salutary effects would no doubt be produced, in a country where the climate is so favourable to health, and I think is proved to have little or no share in occasioning the diseases which are so destructive to the troops.

It has been often remarked, that among the numerous calamities attendant on warfare, infectious disease has ever been considered the most fatal foe: those who fall by the destructive implements of war are few indeed, compared to the great number who perish in our armies and fleets, by the secret malignancy of this disease, and as we find that no region of the globe is exempt from its baneful influence, where military operations are carried on; every precaution we are acquainted with should be put in force to prevent the introduction of an enemy so destructive to the human race.*

The bad construction of the Hospitals, and want of proper arrangement in them, I consider a principal cause of the ill success which attends the military practice of physic, and to have greatly contributed to generate, and, I may say, nurse infection to that degree of virulence which has

* In the little army of the Leeward Islands, under General Abercromby, between the 1st of January, 1796, and the 1st of November; that of 216 officers who perished, 18 only fell by the enemy.

Dr. Mosely on Tropical Diseases, page 184.

been fatally experienced in this and every other quarter, particularly in the West Indies, and on the Continent; for a crowded Hospital, badly situated, want of cleanliness, ventilation, and good nursing, will certainly counteract the best effect of medicine: this appears, by Dr. M'LEAN, to have been severely felt, and fatally experienced, at St. Domingo.

With deference, I offer a sketch of two Hospitals calculated for an army of six or seven thousand men, in this or any other healthy country; which I think, when assisted by great medical skill, would prove a formidable enemy to combat and destroy disease; and from particular inquiry, I can say, the expence of building them would be trifling, considering their utility. Every choice of situation is to be had here (Cape of Good Hope) which is of the utmost importance in fixing an Hospital.

We find the diseases which attend military service in every part of the world, are: FEVER, DYSENTERY, and ULCERS; the latter, though

not produced by contagion, yet from the fœtor, and putrid state of the sore, pollute the air, and render it in a great degree noxious to animal life. In the best ventilated Hospital, where a number of morbid bodies are placed in one ward, foul air will be generated; this, joined to the distress both of body and mind, which each patient suffers from another, must aggravate every symptom of disease, and greatly retard the cure.

By each patient being placed in a separate apartment, many advantages would arise, tending to promote their recovery; infection would be destroyed, and entirely prevented; and the cure accelerated by rest and quietness.

The want of regular and orderly attendants on the sick, by employing men from the different regiments, besides weakening the military force, is found to be attended with other bad consequences to the service. I would therefore propose, that a corps be regularly appointed to the Hospitals, under the name of Hospital attendants; to be composed of sober and humane cha-

racters. The men to wear a uniform to distinguish them from the patients, and might consist of the following:

To the first Hospital of 120 *Patients.*	*To the Convalescent Hospital, of* 160 *Patients.*
1 Ward-sergeant	1 Ward-sergeant
1 Matron	1 Matron
1 Surgery-man	1 Cook
1 Barber	1 Surgery-man
1 Cook	1 Barber
6 Washerwomen	6 Washerwomen
20 Orderly-men	4 Orderly-men
10 Nurses	4 Nurses
4 Blacks to keep the rooms and privies clean	2 Blacks, to keep the rooms clean
45 Total.	21 Total

In concluding this short essay, I cannot forbear remarking, that many of Sir Wm. Blizard's admirable Suggestions (for the Improvement of Hospitals, published in 1796) might be applied to Military Hospitals, not only with equal propriety, but with the greatest advantage, and happiest effects.

The following Outline of a plan for preventing the Introduction of Infectious Disease into the Garrison at Chatham, was forwarded to the War-Office, by Mr. Wood, *Surgeon to the Garrison.*

Upper Barracks, Chatham,
May 1st, 1791.

Sir,

I beg leave to propose a plan which, I think, if adopted, would be the means of putting a stop to the introduction of the jail-fever into the garrison, and prevent the further progress of that malignant disease. It has one thing to recommend it, which perhaps may be deemed a consideration, viz. that it will put Government to little expence, as well as prevent many desertions, and some diseases, the consequence of irregularities.

We know the causes of this disease to be foul air, and want of cleanliness; of course, the men most liable to it, are those confined in prisons, and other unventilated places, where cleanliness to their persons is not attended to: and what renders the introduction of this fatal disease the

more to be dreaded is, that men of this description often retain the infection, and have the power of communicating it to others, though at the time, they have no symptoms of the disease; for it is known to lay dormant a considerable time, until brought into action by some exciting cause.

The Garrison at Chatham being the general receptacle for recruits, many of them brought from the Savoy, and other prisons in England, it is evident what a source of infection must be introduced and propagated through the barracks by their mixing promiscuously; nor is it possible to eradicate it, while the fresh seeds of infection are daily from all quarters brought in.

To obviate those evils, I would propose that a ship of the line (one of the old hulks) be employed as a lazaretto, or receiving ship, and stationed, for conveniency, opposite the garrison.

The recruits, instead of being brought into the barracks, to be sent immediately on their

arrival, on board this ship (particularly those who have been lately in prison) to be stripped of their filthy cloaths, which should be burnt, as well as every thing about them that appears to retain infection.

Their bodies to be well washed with warm water and vinegar, and the utmost cleanliness attended to while they remain on board.

That a superintending officer, with a surgeon, be appointed to give directions respecting the salutary regulations, and medical assistance in such cases as may occur.

Proper non-commissioned officers to be on board, for putting the regulations strictly in force, and preserving order and regularity.

The recruits to remain on board at least a fortnight; but if any appear suspicious, which may be judged from their unsalutary appearance, visible to every medical observer, let those remain a week longer. The itch, and other slight con-

tagious diseases, may be cured before they are sent on shore.

That a ship of a smaller size be employed as an Hospital, for the purpose of receiving such men as may be attacked with the malignant fever; who should be removed from the receiving ship on the first appearance of the disease; and, as the men can be mustered daily by an officer and surgeon present, the earliest attack may be discovered, which is of the utmost importance towards the cure of the disease.

Such is the outline of a plan which, I think, with some improvements, that you and others, more conversant in the service, are capable of making, would tend most effectually, not only to put a stop to the introduction, but check the progress of a disease, which proves so destructive to the troops.

STEWART HENDERSON.

To VINCENT WOOD, Esq.
Surgeon to the Forces, at Chatham.

AN ACCOUNT

Of the Means successfully employed in preserving the Health of the Seamen on Board his Majesty's Ship Astræa, on the Jamaica Station, in the Years 1787, 1788, 1789, *and Part of* 1790;

WITH

Practical Remarks on the Diseases which occurred on Board the said Ship during the above Period.

WHEN we look into the politieal and medical history of this war, we are at a loss to say, whieh of the two great enemies of mankind, Freneh principles, or pestilential disease, has been most destruetive. While it becomes the provinee of the statesman to enact salutary laws, to prevent the baneful influence of principles subversive of all social order, it is no less the duty of the guardians and superintendants of health, to recommend and employ sueh preeautions and means as prudenee and experienee have suggested, to prevent the introduction and eheck the progress of a formidable enemy—pestilential disease; which commits sueh ravages on the human race, and seems even yet to bid defianee to the medical art.

The prevention of disease often depends on circumstances, which to some appear trifling, and therefore are but little attended to; they are, however, found by experience to be of eminent utility and importance. This, I trust, will be shewn in the following faithful account of the Astræa; being an extract from my Medical Register, with practical remarks on the diseases; which I intended to have offered to the public, on my arrival from the West Indies, in April 1790, had leisure permitted.

Previous to giving an account of the means employed on board the Astræa, I think it proper first to observe, that the great and celebrated circumnavigator, Captain Cooke, proved to the world the possibility of carrying a ship's crew through a variety of climates, for the space of near four years, without losing one man by disease; a circumstance which added more to his fame, and is supposed to have given a more useful lesson to maritime nations, than all the discoveries he ever made. He has shewn, that health may be preserved on the most distant expeditions,

undertaken either for the purposes of war or commerce, and by means no less simple than efficacious. It is true, he possessed advantages which few ships of war, on any service, can expect to have; a large roomy ship, to contain a small number of chosen men, all volunteers, provided with every necessary, and cloathing adapted to different climates. Articles of diet, and preventives, which other ships are not supplied with, and the provisions of a superior quality to what is generally allowed; above all, the ship almost constantly at sea, and not obliged to put into unhealthy harbours.

Other judicious and skilful commanders, who have since adopted the means he pursued, have met with equal success, though under less favourable circumstances; this, however, does not diminish the just praise of that illustrious navigator, who well merited the honorary medal bestowed upon him by the Royal Society, and presented by the president, Sir JOHN PRINGLE.

His Majesty's ship Astræa, of 32 guns and 220 men (peace complement) commanded by Captain

Peter Rainier (now Vice-Admiral, commander in chief of his Majesty's ships in India) was fitted out at Woolwich, in October, 1786, and sailed for Jamaica the 6th of January, 1787. I did not join her until a few days before she sailed, so that I had it not in my power to select the medicines most useful for the climate. My predecessor had previously ordered the medicine chest from the Apothecary's Company, perhaps without knowing her intended station. I found, however, that the men were judiciously selected, many of them having lately returned from the West Indies. Upon inspecting the whole of the crew, I had occasion to request ten men might be sent to Haslar Hospital, as being unfit subjects for a hot climate, and, indeed, for the service, being affected chiefly with ruptures and old ulcers.

We were not allowed any preventive articles of diet; no sour-crout, essence of spruce, or malt, orange or lemon juice, potatoes, sugar, or wine for the sick; which necessary articles have been since liberally supplied to his Majesty's ships, in consequence of the able representations of

Dr. TROTTER, physician to the fleet, and other medical gentlemen in the navy; there is now, likewise, a better allowance of vegetables when in port; which, as appears from the medical history of the fleet, has had a very salutary effect.

As we could not call in these auxiliaries, it behoved us to redouble our exertions, and to bestow the greatest attention on those in our power, and which we knew from experience to be most useful. I judged that the health of the men, and exemption from the diseases of the climate, would, in a great degree, depend on cleanliness, ventilation, keeping the deck below free from moisture, cold-bathing, preventing irregularities, and exposure to marsh effluvia; constant employment for the body and mind; but yet to avoid working in the sun before the sea breeze set in; and to provide, when the service would admit, the liberal use of vegetables and other antiseptics.

Such were the means I proposed for the prevention of disease; and from Captain Rainier's character, as a humane and experienced officer,

and his long aequaintance with hot climates, I had every reason to expect, that whatever would tend to a salutary effect would meet with his approbation and support.

I soon found that he well understood that important part of an officer's duty; and it is from his judicious orders, regulations, and attention on the part of the officers, in seeing them well exeeuted, the means employed for preserving and restoring health were so sueeessful, that not one of the ship's company died on board, and only four died at the hospital from disease, during the three years the ship remained on the Jamaica station: a great part of that period we lay in a very unhealthy harbour (Kingston): a singular circumstanee, contrasted with what has sinee happened in that part of the world, and perhaps unprecedented in the naval and military records of this country.

On the passage, we stopped fourteen days at Ferrol and Corunna, where we were supplied with fresh beef and vegetables; and likewise at Madeira, where we remained a week. The men,

as usual, were put into divisions or squads, under certain officers, who inspeeted their eloathing, to see that they kept themselves clean and orderly, particularly on Sundays, when they were mustered by the commanding offieer. During the whole time of our lying on the station, eold bathing was almost daily used. When in harbour, a sail was put over-board, sunk to a eertain depth, and suspended from the yard-arm, to prevent danger from the sharks, or any other aceident to such as might not have learnt to swim. When the lower deck was washed, fires were kept in Brodie's stoves until it was eompletely dried, and well fumigated by the usual mode, as well as in rainy weather, or when there was mueh moisture in the atmosphere. A fire was likewise put into the well, after being swabbed dry, which was more effectual in destroying the noxious air, than the eustom of letting in water by the pumps. To prevent those irregularities on shore whieh too often disgraee the charaeter of British seamen, and soldiers, and expose them to the exeiting causes of disease, Captain Rainier very prudently refused any leave of that kind to men he could

not depend upon. Indeed, after a few months abstinence, they did not seem solicitous to obtain it; knowing they had no money to purchase their favourite, but baneful liquor, or power to sell their necessaries with impunity. I believe the Astræa was the only ship in the navy which had no occasion for what is called a liberty book, while the crew seemed perfectly satisfied and contented without that permission; a proof, I think, of their being under excellent discipline. It is true they were allowed on Sundays, when in port, to visit their acquaintance in the different ships in the squadron, and on those occasions a most complete scene of drunkenness was usually exhibited; scarcely a man but was obliged to be hoisted on board, and in a situation that required no little management to prevent fatal consequences. On those days I thought it necessary to be on board, and to give directions that they should be placed properly in their hammocks. This necessary indulgence, however, was sometimes productive of sickness, but not of that tendency which would have happened had the same inebriety been committed on shore; and

we considered, that constant confinement might have had a worse effect, than the irregularities they were guilty of. When not employed on duty, amusements and diversions were promoted and encouraged by the officers. Neither was there any restriction to women coming on board; which did away one principal motive for their wishing to go on shore.

To guard as much as possible against the bad effect of marsh effluvia, the ship was always anchored as far from the shore, as could in safety be admitted; and in the different islands we visited, St. Domingo, Porto-Rico, Curassoa, Cuba, &c. care was taken to procure fresh beef, and plenty of fish, by hauling the *seine*. This last was never neglected, and it proved to be a very nutritious and proper food in those countries. They were likewise supplied with vegetables, oranges, and limes, which grow in many parts spontaneously; these were procured in abundance, and when it became absolutely necessary to employ the ship's company in wooding (which should never be done, if possible, in hot climates) the parties

were enjoined to be on board before dark, by which they escaped the bad effects of the night air. This service has frequently occasioned the loss of many seamen. The watering duty, another service very destructive to the health of seamen, was performed by blacks, who manned the long boat, and whose constitutions were congenial to the climate.

These were the principal means we employed for preserving the health of our men; the consequence was, as I have already related, that not one of the crew died on board; a fact, which may be seen by the ship's books in the Navy-office; though sickness will always prevail more or less, on board of ships, from causes which no human exertions can prevent. I am persuaded also, that in time of war, from the nature of the service carrying on, the regulations before stated, and the observance of them, cannot be so strictly adhered to; yet I am convinced, from what I observed during nearly the five years I was employed in the West Indies last war, that a great deal of sickness might have been prevented

many valuable lives preserved, had such salutary means been better understood, and attended to.

This, in my opinion, points out the necessity of a code of salutary regulations being established, for the guidance of commanding officers of his Majesty's ships, who may have not had an opportunity of becoming acquainted with the means of prevention, and are liable to err, from a mistaken idea of the causes of disease. Should any general sickness prevail, an enquiry might be instituted, to learn whether it proceeded from unavoidable causes.

GENERAL STATE OF THE WEATHER.

As the weather is justly supposed to have a considerable effect in producing disease, I think it necessary to give some account of it, during the period of three years we remained on the Jamaica station.

I have already observed, that the Astræa sailed from England for Jamaica in the beginning of

the year 1787. Except three or four slight venereal cases, we had no sick on board, having sent to the hospital those whom we deemed improper subjects for the service. In the channel we experienced a great deal of cold, boisterous weather, before we reached Corunna; during which time four men were seized with pulmonary complaints, and one with acute rheumatism. After leaving the coast of Spain, we arrived at that delightful and salubrious island, Madeira. As we approached the warm latitudes, a few, chiefly marines, who had never been in a hot climate before, complained of head-ach, and febrile symptoms, which were removed by bleeding, and other evacuations. In March and April we were on our station at Port Royal. In May and June, when the periodical rain set in, we were on a cruize, in consequence of which we did not suffer from the rains or heat of those two months, and benefited by the refreshing breezes met with at sea; and it has been frequently remarked, that the mariners enjoy a greater degree of health, when at sea in the West Indies, than in port at any other part of the world. Commanding offi-

cers would therefore act judiciously, in keeping ships as little as possible in harbour on that station. Commodore Gardner, then commanding his Majesty's ships in that quarter of the globe, was in the habit of keeping the squadron much at sea, which had a very salutary effect on the crew. During the whole of August, September, and October, which are, what are called, the hurricane months, we went up the harbour, and anchored pretty high, towards Rock-Fort, to avoid the danger of those furious winds, which are sometimes attended with dreadful destruction, both at sea and on shore; this was experienced when I was at Jamaica, in October, 1780; during these months, deluges of rain fell, which obliged us to keep the awnings almost constantly spread and sloping; the sea breezes were interrupted, and the atmosphere in general became excessively close, sultry, and loaded with moisture, attended with thunder and lightning.

During this time, a langüor and dejection of spirits were felt by all on board. As the weather prevented any duty from being performed, and

conscious of a predisposition to disease, we judged it adviseable, to promote every kind of sport and diversion. Dancing, that favorite amusement with seamen, was cheerfully encouraged, as we fortunately had a fidler on board: a more useful man in a ship than a trumpeter, who I believe is generally allowed to his Majesty's ships, but for what purpose I have yet to learn.

In the beginning of November we sailed to Fort Royal, without having a sick man on board, or one left behind at the Hospital; the three men sent thither in September had returned to the ship. Such an extraordinary and uncommon state of health, I cannot impute to any other circumstance, but the salutary regulations above-mentioned, which had been strictly enforced: and above all, that the men were not allowed to go on shore, and thereby less exposed to the exciting causes of disease.

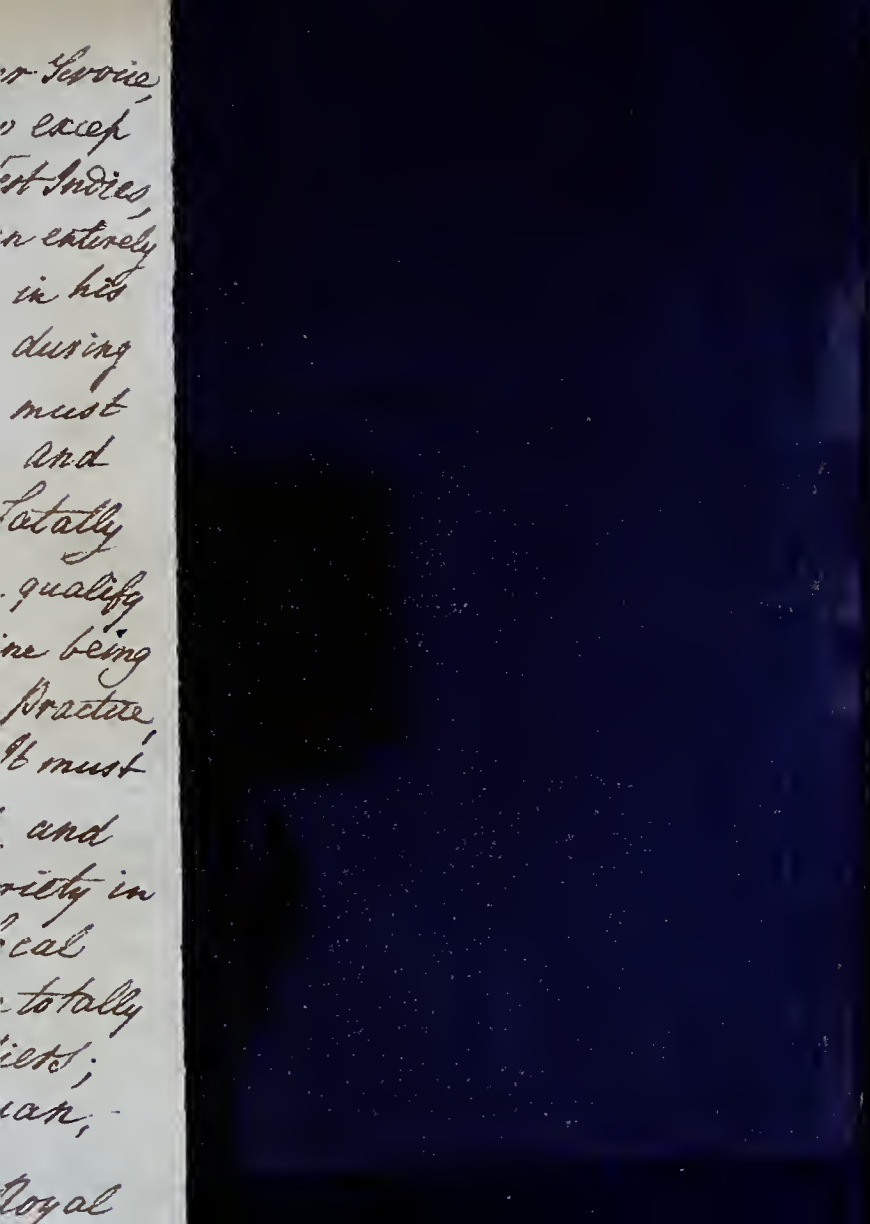
While the ship lay anchored from the main land, as far as safety would permit, we enjoyed the benefit of the sea-breeze, when it did not

reach ships which were nearer the shore; for near these ships it frequently blows but faintly, and partially. In November and December, the weather becomes more settled; a fresh north wind blows in the day, from the continent of America, and in the night a strong land-wind, carrying with it a considerable quantity of marsh-effluvia; at this time the greatest sickness generally prevails in the town of Kingston. As the ships at Fort-Royal are not entirely out of the reach of its influence, the best way to avoid it, is to put to sea; the cold north winds, unimpregnated with that noxious exhalation, will preserve health, and speedily recover convalescents; as we experienced in several cases of remittent fever. The state of the weather during the other two years, varied but little, except in the hurricane months of 1789; we had not the usual rains and squalls, which distinguish that season: the sea breezes became more interrupted, and changeable; for the most part, indeed, a calm prevailed, and the heat was extreme: Fahrenheit's thermometer, during the whole of September, was not under 90° in the shade; but in the beginning of October, a very

hospitals having been *all* taken, this
from the list of navy-surgeons, which has brought



considerable and sudden change took place in the temperature of the air, which was followed by an epidemic catarrh in the squadron, and very prevalent among the troops and inhabitants on shore: very few escaped it; and as comparatively few persons were attacked this year with the endemic remittent fever; it was supposed by many, that the qualities of the air had undergone some change, which had produced this influenza, and prevented the prevalence of the fever. In my opinion, however, our exemption was owing to the want of the usual quantity of rain, one of the necessary agents in producing marsh-miasmata; Fahrenheit's thermometer, during the whole of our lying on the station, seldom exceeded 82 or 83 on board, when not exposed to the rays of the sun.



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PNEUMONIA.

The first disease which occurred was pneumonia, or inflammation in the lungs, and seemed to be occasioned by the cold, boisterous weather we met with in the channel. The patients complained of violent pains in the thorax, cough, and difficult respiration; pulse frequent, and every symptom of pyrexia. In the beginning, bleeding was made use of, which afforded relief; a purgative was given, and a blister applied to the thorax; the sp. minder. with acet. scillit. and sometimes the vin. antimon. were given, with a view to promote perspiration and expectoration, which came on about the third or fourth day, and kept up by acidulated and demulcent drinks, ad libitum. In the convalescent state, bark and wine, with a nourishing diet, were ordered, to recover from the debility, which the evacuations, and copious expectorations had occasioned. Our coming into the temperate latitudes seemed to accelerate the removal of these complaints; except in one man, a marine, who, after we left Madeira, informed me, that he was very much troubled with a cough, and spitting of matter.

Upon examination, it had every appearance of proceeding from an ulcer; his pulse quick and frequent, and profuse sweats in the night; he acknowledged to have been ill a twelve-month, and had only returned from the Hospital a few days before he embarked; he being told by the surgeon, whose care he was under, that he might recover, if he went to a warm climate, which was his motive for not making his illness known when he came on board, for fear he would have been returned to quarters. Had he applied to me before we left Madeira, I would have requested to have had him left on that island, where he would have had every chance of recovery, from the mild temperature of the climate; as his disorder was far advanced, and the heat of the weather increasing the debility, I had little hopes of his living to reach Jamaica. To mitigate particular symptoms, such as cough, pain and stricture in the thorax, an antimonial anodyne draught was given every night, a blister was applied to the pained part, and kept open; with a view to heal the ulcers in the lungs, I attempted it on the principle of supporting and

restoring the general health; the Peruvian bark was given, with some preparation of steel; rice and sago for diet, with sometimes a bit of fowl, and good Madeira wine, humanely allowed from Captain RAINIER's table, and often from the officers' mess.

On our arrival at Port Royal, he appeared to have gained strength; but from being much disturbed by the noise on board, I thought it best to send him to the Hospital, that he might have the benefit of a milk-diet, rest, and quietness; but he died soon after. Upon the whole, from this man's case, and many others, which have since fallen under my observation, I cannot recommend a hot climate for confirmed pulmonary consumption.

RHEUMATISM.

This disease, to which seamen are particularly subject in northern latitudes, when exposed, after being overheated, to the sudden influence of cold, is distinguished into the acute or chronic:

the latter is often feigned, and not easily discovered by the most discerning physician. This complaint was the consequence of the cold moist weather, which produced pneumonia. The first patient was of a plethoric, and rigid fibre, complained of universal pains, especially in the joints, which were most severe when warm in bed; pulse frequent and hard; thirst increased. Bleeding was freely made use of, which relieved the pain, and abated the febrile symptoms; a purgative was given, and he took one scruple of the pulv. dover. every hour, until a plentiful perspiration came on; it was kept up, and encouraged by drinking balm or sage-tea; by repeating the sudorific, his fever, and pains left him, except in one of his knees, which a blister removed.

The other case which occurred was of a chronic nature. The patient chiefly complained of pains affecting the lower joints, without febrile symptoms; he was of a relaxed and debilitated habit. Upon enquiring into his character, I had no reason to suppose that his complaint was not real. I put him on a better diet, with wine,

and to take 40 drops of the tinct. guaic. volat. with 20 drops of tinct. opii, twice a day; at the same time to strengthen the system, and restore the parts to their proper tone, bark and steel were given, and warm stimulating applications to the pained parts. By a continuance of those stimulants and tonics, all his symptoms were removed; perhaps assisted by the warm weather, for he had no return of them, during the rest of the station; a proof that a hot climate is favourable, for preventing the attack and recurrence of this disease. Had his complaints not given way to these remedies, I intended to have given him calomel as an alterative, having found it of great service in several cases of rheumatism, especially when there was reason to suspect a venereal taint in the habit.

REMITTENT, OR MARSH FEVER.

This fever, the legitimate offspring of all hot climates, especially where marshes abound, is the autumnal disease of most parts of Europe, only appearing in a milder degree. It has been described by authors under various names, *bilious*,

yellow, *Jamaica*, *Senegal*, and in Bengal, *pucka*; but multiplying distinctions which do not exist, only serves to perplex and mislead; for it will be found to be the same individual disease, under different modifications, depending on constitution, season of the year, and local situation. The cause of this fever, in all its varieties, is marsh effluvia; nor can, in my opinion, any other cause produce it. We find that, in some places, as at the Cape of Good Hope, where no such cause exists, this fever is unknown. We likewise find, that strangers are more liable to be affected by this noxious effluvia, and have the disease in a more formidable degree than the natives of the country, whose constitutions acquire a certain power of resisting it from habitual exposure: at the same time, its effects on them are obvious, by shortening the duration of life. I do not think that the original disease produced by this miasma is infectious, but that it may alter its type, and become highly contagious from concurrent causes; as from too many diseased bodies being crowded together, without paying sufficient attention to ventilation and cleanliness.

This appears to have been the case in the British Hospitals, in every part of the world, and occasioned the great mortality which has prevailed in the army, particularly in the West Indies, and on the Continent.* When a man was sent into these Hospitals, however slight his complaint, it degenerated, in a very few days, into the most malignant fever; and as Dr. SINNOT very justly remarks, there was less danger in entering into the field of battle, than attending our sick in the General Hospitals. This noxious exhalation enters the system, either by the lungs, skin, or stomach; but the manner in which it produces those symptoms of disease, which characterize the fever, does not appear to be well understood. We can only perceive its general effects on the system; and that it may lurk for a certain time in the habit, before morbid movements take place. Several instances of this occurred when I was last at Jamaica. His Majesty's sloop of war,

* Sir JOHN PRINGLE remarks, "among the chief causes of "sickness and death in an army, the reader will little expect, "that I should rank what is intended for its health and preserva- "tion, the Hospitals themselves."

Diseases of the Army, page 8.

Alert, went up to Rock Fort to water, and anchored close to the shore, when the atmosphere was charged with marshy exhalations; her crew were then in perfect health. She immediately went to sea, and fourteen days after, the greatest part of the men were attacked with the remittent fever, and it was observed, that the men who had most access to the shore, were the first seized with the complaint. The subjects on whom this fever exerts its greatest violence, are of two different temperaments; first, the young and plethoric, and those of a rigid, irritable fibre, and great excitability, have every thing to fear from exposure to the action of this poison, especially when the body has been overheated, either by the use of stimulating liquors, or by violent exercise in the sun; secondly, those who are under the impression of fear or disappointment, and are constitutionally deficient in energy of mind and body, who may be said to be considerably under the standard of health, and easily affected by every debilitating power.

As this exhalation is found to exert its influence to a considerable distance, notwithstanding every

precaution to prevent it, thirty of our men felt its effects on board of ship. The patients of the first class were young men (chiefly marines) of athletic habits, who had never been in a hot climate. They complained of nausea, sickness, violent pain in the head, particularly in the fore-part, and strong pulsation of the temporal and carotid arteries; the eyes became red and turgid, with evident determination of the blood to the brain. The lungs and stomach appeared to be in a state of inflammation, and great irritability; the latter rejecting every thing taken into it; the tongue white; skin dry; the pulse quick and full. From the violence and rapidity of the symptoms affecting organs of primary importance, I considered it necessary that something decisive ought immediately to be done, before the morbid movements had made too great progress. With a view to relieve inflammatory symptoms, and prevent the brain being oppressed, bleeding was freely resorted to, and not by any determined quantity, but until the symptoms subsided, which was manifest from the pulse becoming soft and regular. Cool air was freely ad-

mitted, and cold applications to the head were directed to be used; after bleeding, a large blister was applied to the region of the stomach, which removed the pain and irritation of that organ. Calomel, with James's powder, were administered to procure stools, and promore perspiration; this was encouraged by drinking, *ad libitum*, of balm or sage tea. In the convalescent state, bark, wine, and a nourishing diet, were had recourse to, which removed the debility brought on by the violence of the symptoms, as well as that occasioned by the necessary evacuations.

The second class were men of a lax fibre, and diminished energy of mind and body, with a considerable degree of nervous irritability, and but little vascular excitement. The effects of the virus upon these, were giddiness, sickness, and disagreeable sensation at the stomach, attended with frequent vomiting, of a ropy matter; the head much affected; the pulse quick, irregular, sometimes tense; the countenance desponding; the skin dry; the tongue white; the belly torpid; the secretion of bile diminished; the urine scanty and limpid. As there was no in-

flammatory disposition inducing dangerous determinations of the blood, bleeding was not employed; although there was nausea and sickness. Antimonial emetics were not used, having always observed that they encreased the irritability of the stomach, which is the most troublesome symptom attending this form of the fever; a blister sometimes had the best effect, when applied to the region of the stomach, and, in some cases, over the whole of the head. Camomile tea, and the effervescing draughts, were given, with a view to relieve the nausea and vomiting: to promote perspiration, James's powder, with camphor, were administered every hour, until the effect was produced. The bowels were opened by rhubarb and calomel; to support and encrease the energy of the system, bark and wine were administered, as soon as the stomach had the power of retaining them, and continued with a nourishing diet, until health was perfectly restored.

There is another form in which this poison acts on subjects partaking neither of the violent

inflammatory symptoms of the first, nor the diminished energy or nervous affection of the second. Men, who may be said to be neither above nor below the common standard of health, are able sometimes to overcome the influence of this noxious vapour; but, when the habit was not vigorous enough to resist it, they were generally seized with cold shivering, succeeded by great heat, sickness, and sometimes a vomiting of bile; the tongue white and furred; the pulse quick and full; thirst great; urine high-coloured; although there were marks of irritation and inflammatory diathesis in the beginning, but yet not sufficient to justify blood-letting; which I considered would have diminished the vital power, and reduced the patient to the same state as described in the second form. I therefore thought it more adviseable to employ mercurial purgatives, which had a very good effect in carrying off the bilious sordes collected in the first passages, and supporting, in a great degree, the febrile phenomena; emetics were sometimes given; James's powder, with camphor, to promote perspiration, and effect a complete remission. After

the bowels were emptied, and the sudorific process completed, the bark was immediately given, and continued day and night, which generally checked the progress of the disease. Wine, and a nourishing diet, in the convalescent state, were always allowed. In concluding these few remarks on the varieties of the endemic fever, I must observe, that the first form of the disease appears only in subjects newly arrived from Europe, the young and plethoric; for a residence in a hot climate, and other debilitating causes, remove that rigidity of fibre, and density of the fluids, which co-operated at first in producing those violent derangements. Men of this description should therefore, before their arrival, undergo some preparation to reduce their habits; while those of the second class, ought to resort to means which may give a certain degree of strength and energy to the system. They will then have the disease in a milder degree, such as it appears in those subjects attacked with the third form of the disorder.

INTERMITTENT FEVER.

This may be said to be another variety of the endemic, in a milder degree, occasioned by the same cause, marsh-miasma, introduced in a smaller proportion into a constitution not disposed to be affected with morbid movements. The cases of this fever which occurred, happened in the healthy season of the year; they were mostly tertians. After an emetic and purgative had been given, the bark was ordered to be taken every hour during the intermission. On the approach of the cold fit, 40 drops of antimonial wine, with 20 of tinct. opii. were administered; which lessened the violence, and shortened the duration of the paroxysm. In some cases, I found it beneficial to give wine and powerful stimulants, so as to keep up and encrease the action of the arterial system, beyond the usual period of the returning paroxysm; while the bark was given every hour without intermission, unless prevented by the patient being asleep: careful sentinels were placed over the sick, and they were frequently visited in the night, by myself, or my assistants. Calo-

mel, in small doses, was of benefit in some cases, where I conceived the disorder proceeded from visceral obstruction; while others required a change of air, of which they had the benefit, when removed to Port-Royal Hospital.

DYSENTERY.

This disease is not limited or peculiar to any climate; nor is there any natural cause known to produce it: if it were occasioned by any particular quality in the air, the natives, as well as seamen and soldiers, would be attacked with it; but we find this is not the case, for when the dysentery was raging in the British army at the Cape of Good Hope, where great numbers died, not one of the inhabitants were seized with it; nor is it a disease known among them. Whenever it becomes epidemic among the inhabitants of any country, it may always be traced to infection introduced; it being the constant attendant on camps, and the scourge of an army, more destructive than any other enemy. I therefore consider it an *artificial* disease, brought on by

those unavoidable hardships, to which soldiers and seamen are exposed. Cold and dampness, when the body is not sufficiently covered, by obstructing perspiration, and encreasing the determination of the fluids to the intestines, sometimes combined with febrile miasma, produce the whole phenomena of dysentery.

In the treatment of this disease, I generally began with an emetic of ipecacuanha, with a grain of tart. antimon. Bleeding was never employed, unless the patient was of a strong plethoric habit, and the febrile symptoms run high. Purges of salts, or rhubarb with calomel, were frequently repeated; at night, 40 drops of antimonial wine, with 20 of tinct. opii. which promoted perspiration, and relieved the spasms, when the tenesmus was troublesome. Emollient injections with opium, and fomentations were of use, when the pains were wandering; but when the pain became fixed in any part of the intestines, indicating inflammation, a large blister was instantly applied, which in every instance removed it; perspiration was kept up by repeated doses,

either of preparations of antimony, or Dover's powder, assisted by warm diluents. In cases combined with the remittent symptoms, inducing great debility, accompanied with sanguinary discharges, bark and wine were given, with farinaceous vegetables for food, such as rice, sago, or tapioca; sometimes to ease pain, and procure a little rest, opium was given, but seldom without some medicine to determine its action to the surface.

A few cases occurred unattended with fever, violent gripings, or tenesmus: in these mercurial purges and calomel, in small doses, were prescribed with success.

DIARRHŒA.

This disease generally arose from relaxation, brought on by eating unripe fruit, and committing other irregularities. It was easily removed by lenient purgatives, followed by astringents and tonics.

HEPATIC COMPLAINTS.

Having served in India with his Majesty's troops, during the campaigns of 1782, 1783, and 1784, in the Carnatic and Southern Provinces, I had frequent opportunities of seeing liver-complaints, a disease often occurring in every hot climate, though not always suspected or discovered, and sometimes confounded with complaints of the pleura or lungs. The cases which occurred on board the Astræa were brought on by violent exercise in the sun, joined to the abuse of spirits. The patients complained of pain in the side, with some difficulty in respiration; the pulse full and frequent, sometimes they felt a pain in the shoulder, and about the region of the liver, which last, when pressed, was attended with a catching and troublesome cough. Bleeding, calomel-purges, and a blister applied to the side, and sometimes mercury in small doses, were alternately resorted to, until health was perfectly restored.

In chronic cases, the patients did not complain of acute pain, but a dull, obtuse pain in the

hepatic region; the countenance dejected, and the animal spirits greatly diminished; the eyes dull, but not yellow; the tongue dry; the stools small, frequent, and sometimes mixed with mucus, as in dysentery; the appetite irregular, often voracious. In these cases, without any preparation, I had recourse to mercury, either internally, or by friction, which last I preferred. The good effect of this treatment became obvious from the favourable change of that dejected countenance, so characteristic of the complaint, for a more cheerful one: and from the energy being restored to the hepatic system, which we discovered by the secretions; the stools becoming more regular, and of a natural colour: their diet consisted chiefly of small quantities of animal food, with the farinaceous vegetables.

SPASMODIC AFFECTIONS.

Those affections were mostly confined to the abdominal viscera, and brought on by lying upon deck in the night. The patients complained of excruciating pain and stricture, commonly about

the umbilical region, nausea, and sometimes vomiting. If fomentations did not cure the pain, a large blister was applied; calomel with jallap taken internally, and glysters thrown up, until stools were procured, which removed the complaint.

One case occurred where the spasms were general. A man of a weak, irritable constitution, after taking an antimonial emetic, which operated rather violently, was seized with coldness on the surface of the whole body; violent contractions of the lower extremities, extending to the muscles of the abdomen, diaphragm, and ribs; the muscles of the face and neck became violently convulsed and distorted; the eyes sunk, and no pulse any where to be felt; respiration hardly to be perceived; he lay for some minutes in this state, so that, while the warm bath was getting ready, the by-standers, from his external appearance, concluded he was dead. Volatile and stimulating applications were used, together with frictions with hot cloths; injections of warm water and laudanum were thrown up; wine mulled with

spices was given, until the heat of the body was restored; by persevering in these remedies, the disease at length yielded to this treatment; but he continued in a state of debility for some time, which rendered the administration of bark, cordials, and, at the same time, a nourishing diet, useful and necessary.

SCURVY.

The four cases of scurvy which occurred, were those of men who were devoted to irregular habits, and had for some years manifested a predisposition to the disease. Every care was taken to prevent it, by a sufficient allowance of vegetable aliment, a deficiency of which only can produce the disease; and before we went on a cruise, I took care to provide for the remedy on board. Plenty of lemon or lime-juice was given on the first symptom of the disorder, joined to what vegetable diet the ship afforded.

EPIDEMIC CATARRH.

This catarrh, resembling the influenza, which was so prevalent in England and other parts of

Europe in 1782, made its appearance on board the Astræa the 5th of October, 1789, when at anchor off Kingston: in the course of a few days there was hardly a man in the ship but was attacked in a greater or less degree; most of the squadron felt its influence, but it was observed to seize mostly those who had been longest on the station. The Centurion and Blonde, ships newly arrived from England, had hardly any taken ill. The people in the town of Kingston, especially the lower class of whites and negroes, who sleep in out-houses, were generally affected. The appearance of the disease at different periods pervaded the whole island, sometimes prevailing in one place a week before it was felt in another; as happened to the 10th regiment, stationed at Fort Augusta, which is only four or five miles from where the squadron lay.

The symptoms varied in different persons; in some they were complicated with the endemic remittent; in general they were seized suddenly with chillness and shivering, succeeded by a hot fit, langour, and lassitude; pain and stricture

across the thorax, with some difficulty of breathing; anxiety, sickness, and violent pain in the head, particularly above the orbits; frequent sneezing, the membrana schneideriana much affected; heat and soreness in the throat, with frequent cough. Some complained of a violent pain in the loins, which was much increased upon motion; one had a bleeding from the nose; delirium appeared in some, but only in those who had catarrhal symptoms, complicated with the remittent fever; the tongue white, and in some yellow; the pulse quick and small; the skin dry; the belly, in general, costive. Though the pain of the breast and side was sometimes violent, yet the pulse was seldom hard; no mark of inflammatory diathesis so as to indicate bleeding; debility commenced with the disease and continued after the catarrhal symptoms were gone, requiring the use of bark and the most powerful cordials; relapses were frequent, from being exposed to the weather, but the symptoms were in a milder degree.

This disease appeared to me to be occasioned by the sudden transition of the weather. The preceding month had been uncommonly hot, such as had never been felt by the oldest inhabitant in Kingston; the thermometer in the day, being never below 90 in the shade. During this month, people were afraid to stir out; several from being exposed to the intense rays of the sun were seized with phrenzy, which in two instances, I was told, proved fatal. The sea-breezes were pretty regular; but we had not the usual rains and squalls which distinguish this season, and characterize what are called the hurricane months; partial showers, indeed, fell in the mountains, but did not reach the vallies. In the first week of November, the thermometer fell 10 degrees in the day, and experienced a much greater change in the night: the sea-breezes left us; the air became so foggy as to obscure the solar rays; a degree of dampnesss was felt, and in the night, a strong land wind blew from the mountains, carrying with it a sensible degree of moisture. Every one who was exposed to this

air was suddenly attacked with the disease. All those men who slept upon deck without any covering, which many were induced to do from the great heat below, suffered from their imprudence; for they had the complaint in a more violent degree than the rest who were afterwards seized.

I remarked, that the men who slept below in the cable-tier were the last seized, and had the complaint in a slighter degree; but the symptoms not being so violent, might be owing to the predisposing cause being somewhat abated, on a change of the weather. For about the latter end of the month, the sea-breezes returned, with squalls, which soon dispersed the surrounding vapours, and gave a brisk circulation to the stagnated air. With this change the disease disappeared.

The Centurion and Blonde not being affected, proved clearly that no contagion existed in the air. I imagine their exemption from it was owing to the constitutions of the men not having arrived

at that degree of relaxation and irritability, which a continuance of some years in a hot climate never fails to produce, and renders the habit more susceptible of the sudden influence of cold, which appears to have been the sole cause of this epidemic catarrh.

In the beginning of the complaint, an emetic was generally given, which relieved the nausea and sickness, and produced some degree of perspiration. This was encouraged by keeping the patients in bed, and causing them to drink plentifully of warm sage-tea, barley-water, &c. From the number of men confined below, as well as the nature of the epidemic, and state of the air, I thought it necessary to keep buckets of hot vinegar under their hammocks, to correct the stagnated air. Antimonials, with the tinct. opii, were administered; the vin. antimon. was what I in general used, thirty to forty drops four times a day, adding to each dose ten drops of the opium tincture; and by the assistance of the warm bath, a plentiful perspiration was kept up. To relieve the cough, and promote expectoration, the sp.

minder. with the oxymel scillet. were ordered. The tart. emetic, given so as not to produce full vomiting, afforded great relief to the febrile symptoms, by promoting perspiration, and removing the mucus accumulated in the bronchiæ. When the pain and stricture in the thorax was violent, blisters gave relief. Bark was given in those cases which partook of the remittent type; and, on account of the debility which commenced and continued with the disease, wine was often necessary. From the same cause, bleeding was not made use of on board the Astræa. Indeed, I found that the men from being so long exposed to the debilitating effects of a hot climate, bore evacuations very ill. These were the principal means we employed for the cure of this catarrh, and when unattended with pulmonary symptoms, it soon yielded to them. In those cases which terminated by expectoration, the debility was very great, requiring a nourishing diet, and plenty of good wine, which was never spared on these occasions.

ULCERS.

Of ulcers, and the nature of the ulcerative process, much has been said of late by eminent medical characters. It is only my intention here to take notice of that ulcer to which seamen and soldiers are more particularly subject, from the nature and manner of their life. Next to fever and dysentery, this complaint proves the most destructive to British seamen and soldiers, and no surgical disorder has deprived his Majesty's service of so many men, as every experienced surgeon must have observed, who has attended our Hospitals during war; nor are there any cases more unfit for General Hospitals on their present principle.

When I acted as surgeon to his Majesty's Naval Hospital at Antigua, in 1780, nearly one third of the patients laboured under this complaint. Being at that time a young surgeon, I was unwilling to run the risk of deviating from established authorities, and therefore pursued

the plan pointed out by men of high repute in the profession. Our method of treatment then consisted of poultices, various ointments, and other relaxing applications, with a sparing use of tonics and stimulants; rest and confinement were strictly enjoined. I could not help lamenting the inefficacy of those remedies, when I saw so many fall victims to the disease, and others lose their limbs, by being obliged to undergo a painful and hazardous operation. Baffled in every attempt to heal these ulcers, I was under the necessity of having recourse to an operation, as the only chance of saving life.

Dr. Young, physician to the Hospital, Mr. Weir, surgeon of the Alcmena, now physician to Lord St. Vincent's fleet, agreed with me in the necessity and propriety of performing the operation. We considered that it was only assisting nature, for she was endeavouring to get rid of a part which had become useless, and was contaminating the whole system. I was further encouraged by the anxiety of the patients to have it done; and what gave me greater reason to

expect success, was, that in a row of empty rooms appropriated for officers, I had the liberty of putting the men before the operation, where they could breathe pure wholesome air, which they had long been strangers to in the Hospital. Fourteen underwent the operation, most of them below the knee, which I always prefer when the case will admit of it. Such was the advantage of their being removed from the noxious air of a crowded ward, that in a few days all their hectic symptoms left them; appetite returned; the stumps put on a very healthy appearance, and continued to do so, until the ulcer contracted to about the size of a half-crown, when it seemed to be stationary, discharging a thin ichor. Though their appetites were good, and notwithstanding they had a nourishing diet, and good Madeira, and at the same time bark and other tonics, they did not appear to gain strength. From their pale and languid countenances, I judged that moderate exercise in the open air, in the morning and evening, with the use of the cold bath, which happened to be convenient, might have a good effect in restoring their general health. I

immediately procured crutches for them, and had them plunged in the salt water every morning. The good effect was soon visible, not only in their countenances, but the sore put on a fine, florid, and healthy look, discharging good pus, and contracted daily. They all recovered, except one man, a landsman, who was a very irregular liver, and who, notwithstanding every precaution was taken to prevent it, procured and drank immoderately of new rum; part of a bottle of this poisonous liquor being found in his bed when he died.

The bad effect of foul air on ulcers I had an opportunity of witnessing at the Cape of Good Hope. A great number of the seamen and soldiers had ulcers, occasioned by the immoderate use of ardent spirits, and their not using sufficient vegetable aliment. The climate itself is remarked for its salubrity, and the British army for a considerable time past have been in a state of health, unknown in any other part of the world. Storehouses appropriated for the reception of the sick, were then extremely crowded, and the air so

vitiated, that the slightest case degenerated into the most malignant, in the course of a few days. Notwithstanding every effort of very able surgeons, numbers died, and many lost their limbs; none I believe recovered from the operation, until they thought of removing them to separate apartments, which had the same good effect as at Antigua.

From what I have observed of the bad effect of crowding patients afflicted with ulcers, fever, or dysentery, it appears, that the best and most powerful remedies will fail, when the patients are deprived of that great pabulum of life, pure atmospheric air, on which the preservation and restoration of health so much depend. Three feet, the greatest space generally allowed between the beds, is not sufficient, in wards containing acute infectious diseases and ulcers; the fœtor arising from one large ulcer, will contaminate a whole ward, and render the air noxious to animal life.

On finding such beneficial effects from exercise, pure air, and cold bathing, in accelerating

the healing of the stumps, I was led to try what these combined would effect in the cure of the ulcers.

The ulcers, to which seamen and soldiers are particularly subject, are brought on, as I have before remarked, from their not using sufficient vegetable aliment, joined to irregularities, especially the abuse of spirits, heat and moisture, and exposure to impure air. In a constitution previously prepared by such debilitating powers, we can easily conceive, that the smallest scratch will degenerate into an ulcer, which, when below the knee, becomes very difficult of cure, often baffling every attempt of the healing art. This arises from the state of the fluids, and general debility, but particularly in the extreme parts, where there is a greater deficiency of vital principle, even in health. Perhaps the tendinous structure of the parts, and their depending situation, may assist in retarding the cure of ulcers situated upon the lower extremities.

APPEARANCE OF THE ULCER.

The ulcer generally makes its appearance on the fore or inner part of the leg, near the ancle, and discharges a thin acrimonious matter, excoriating the surrounding parts. On neglect or improper treatment, it enlarges daily; the discharge becoming more and more acrid, attended with a putrid fœtor; fungous excrescences begin to rise; the limb becomes œdematous, and very painful. Sometimes, on the least touch, or depending position, a hæmorrhage takes place; the bones become carious; putrid sloughs are cast off daily; and from the constant irritation, the patient is kept in continual pain; has restless nights; and a hectic fever with colliquative sweats succeed. In this state, if the operation be not soon performed, a diarrhœa generally comes on, which in a few days closes the scene.

The progress of these symptoms will depend more or less on the constitution of the patient, the putrid diathesis in the system, exposure to miasmata, and in general to all the predisposing

causes. In our expedition to St. Juan's, during the last war, such was the state of the air at that place, as I was informed by a surgeon in actual service there, that the slightest wound on the lower extremities degenerated into the worst symptoms I have described of this ulcer, in the course of three days, and carried off the patient in spite of the most powerful antiseptics.

CURE OF THE ULCER.

In the cure of the ulcer, I have found that all relaxing and emollient applications are improper, unless when pain and inflammation require their use: when these symptoms are removed, they should be laid aside. The external applications, which in a great number of cases have succeeded with me, were warm and stimulant, increasing the action of the extreme vessels, and restoring the parts to their proper tone. With this view, I used the hydrargyr. nitrat. rubr. in powder, and sometimes in the form of ointment, or the solution of arg. nitrat. I often found it necessary to vary those escharotics: or

leave them off when the discharge was copious, and apply dry lint, with slips of cerate to defend the edges; and over that a compress of linen, wet in a solution of sacchar. saturn, with the addition of a little camphorated spirit, supported by a roller of thin flannel or cotton, which was moistened in camphorated vinegar, renewed two or three times a day, and continued from the extremity of the foot to a little below the knee, not to prevent the motion of the joint, nor the action of the muscles. This enabled the patient to use moderate exercise, which I strictly ordered as soon as the pain and inflammation abated. This, with the daily use of the cold salt-water bath, greatly accelerated the healing process, and assisted in restoring the general health. When the discharge was fœtid, lint dipped in tincture of myrrh, bark, or carrot poultices, corrected the fœtor, and lime-juice proved a good detergent.

While these external means were employed, internal remedies were at the same time administered, with two intentions; first, to correct the

putrid diathesis, and produce good juices; secondly, to brace and strengthen the system.

To answer the first, the bark was given in copious doses; lime-juice, and a large proportion of vegetable aliment, with plenty of good wine; while evacuations, which might lesson the vital principle, as well as debilitating causes, were carefully avoided. The second was effected by preparations of steel, assisted by exercise, and the cold bath: but what I conceived to be the most efficacious, was a very liberal allowance of pure atmospheric air, which I considered to be of greater importance than all the other remedies; for, deprived of that, all the rest would effect no salutary purpose. The incalculable mischief which the want of that sovereign remedy has produced in our hospitals, is well known, and experienced by every medical man of observation.

In concluding these few remarks, I am sensible that the success we met with did not depend on any particular mode of treatment, differing from the common practice; but was more owing to having

it in our power to attack disease on its first commencement, before morbid movements had made much impression; thereby affording me an opportunity of cutting short the disease, or at least obviating its danger. At the same time, cleanliness and wholesome air were particularly attended to, and every cause removed which was likely to aggravate symptoms, or counteract the effect of medicine; while Capt. RAINIER very humanely allowed the sick, wine and fresh diet from his table. Without those aids, all our medicines, I fear, would have availed but little.

A TABLE,

Shewing the different diseases and casualties which occurred on board His Majesty's Ship Astræa, from her leaving England for the Jamaica Station, in January, 1787, to her arrival at Chatham, in June, 1790; comprehending a period of three years and a half.

DISEASES.	
Pulmonic complaints	5
Rheumatism	2
Remittent fever	68
Intermittent fever	52
Slight fever, the effect of cold, or irregularities	97
Dysentery	7
Diarrhœa	7
Hepatic complaints	15
Spasmodic affections	31
Scurvy	4
Epidemic catarrh	50
Ulcers	12
Contusions and slight wounds	372
Fractures	6
Number of Patients	741
Sent to the Hospital	111
Invalided to England	11*
Died in the Hospital	8†
Died on board	none‡

	Years.	*Months.*	*Days.*
At Sea, or in Ports where no sick were landed	1	2	26
At Port Royal	1	4	5
In Kingston Harbour	0	9	4
Ports in England	0	2	0

* Of the eleven invalided, or sent to England for change of climate, five were received on board, at Jamaica, labouring under chronic complaints, contracted on shore; Captain RAINIER very humanely received them for that benevolent purpose. From the nature of their disorders they had no chance of recovering while they remained in the country.

† Of the deaths in the Hospital, three were from accidents, and one a marine, who was ill of a pulmonary complaint, six months before he left England; so that four can only be said to have died from diseases of the climate.

‡ Officially authenticated by the following Certificate from the Navy Board, given by order of the Comptroller, SIR ANDREW HAMMOND, Bart.:

" *THESE are to certify, that it appears, by the Books* " *of His Majesty's Ship Astræa, in this Office, that Mr. Stewart* " *Henderson was Surgeon of the said Ship, from the 28th Decem-* " *ber, 1786, to the 28th June, 1790, comprehending a Period of* " *Three Years and a Half, during which Time not any Seaman or* " *Marine died on board the said Ship, but eight who were sent* " *to Port Royal Hospital died there.*

" *R. E. NELSON, Secretary.*

" *Navy Office, 9th March, 1799.*"

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